Fertilizer MSDS

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Sulfur
Registration No: None

M17500

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Sulfur
Common Name: Sulfur
Chemical Type: Fungicide and Acaricide

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	LD_{50}
Sulfur	7704-34-9	S	Hazardous (solid) 99.5	10mg/M^3 - Nuisance Dust	NE
None listed			Non-Hazardous		

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Relatively non-toxic. Large doses by mouth may lead to hydrogen sulfide production in-vivo, chiefly due to bacterial action within the colon. A man has survived the ingestion of 60 g of sulfur over a period of 24 hours.
Inhalation: Not normal route of entry.
Eye Contact: May cause abrasion to the eye.
Skin Absorption: Low order of skin toxicity.
Skin Contact: May cause aggravation of the skin. May burn if in liquid state. See first aid.
Effects of Overdose: H_2S paralyzes respiratory system, rapidly causing unconsciousness. Dust aggravating to eyes and respiratory membranes. Low order or oral and skin toxicity.

SECTION 4 FIRST AID MEASURES

Ingestion: Not listed
Inhalation: If overcome by H_2S gas remove immediately from exposure and call a physician; administer artificial respiration if breathing is irregular or has stopped. Rush to medical attention.
Eyes: Immediately flush eyes with plenty of water for at least 15 minutes. Seek medical attention if condition persists.
Skin: If burned, flush the area with plenty of water to dissipate heat. Do not try to remove the sulfur. Cover with a clean, dry bandage and get the patient to a physician. Attempts to remove sulfur may damage the flesh. Do not apply petroleum jelly, mineral oils, or ointments. They may complicate the removal of sulfur by the physician.
NOTE: Rescuers must wear positive pressure air supplied breathing apparatus to avoid overexposure to H_2S.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use water spray to cool fire-exposed surfaces, protect personnel, and knock down hazardous fumes; smother small fires with sand or fine earth. Fight large scale fires with water spray or fog.
Special Fire Fighting Procedures: Self-contained breathing apparatus required for fire fighting personnel.
Unusual Fire and Explosion Hazards: Low hazard. Material will burn only if heated above 335°F. Primary hazard is mechanical or electrostatic ignition of sulfur dust/air mixtures or contained H_2S. Vapor space in closed containers can contain H_2S in explosive concentrations greater than 33,000 ppm. Hazardous gases will form upon combustion.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Sulfur is not toxic to fish, bees or animals.
Steps to be taken in case material is released or spilled:
Eliminate sources of ignition. Keep public away and advise of high temperature if liquid sulfur is involved. Shut off source if possible to do so without hazard. Advise police if substance has entered a sewer or water source or has contaminated soil or vegetation. Sweep up spilled material and place in containers for recycle or disposal. Allow liquid to solidify then scrape up.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Unsuitable materials include copper and its alloys. Use of nonferrous tools are recommended. Liquid sulfur should not be put in any tank, rail car, or truck trailer that contains trace quantities of hydrocarbons. Avoid overloading on truck trailers and rail cars. Entry into empty molten sulfur storage tanks, rail cars, or truck trailers should be prohibited except for qualified repair personnel equipped with positive pressure air masks.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Maintain TLV limits.
Respiratory Protection: Nuisance dust respiratory protection for normal situations. Self-contained breathing apparatus required for fire fighting personnel and personnel opening hatches for loading, unloading or gauging.
Protective Clothing: Wear protective gloves, long sleeved shirts, pants without cuffs and high top shoes, avoid frequent or prolonged skin contact.
Eye Protection: For liquid state, use face shield. For solid state, use conventional safety glasses.
Other: Wear pants without cuffs and high top shoes. Eyewash fountain and safety shower in work area.

Trade Name: Sulfur
Registration No: None

M17500

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: 832°F/444°C
Density: Solid: 2.0 @ 60°F
Flashpoint: Pure: 370°F TOC, Impure: 335°F TOC
pH: Not listed
Appearance: Bright yellow to brown, solid at room temperature.
Extinguishing Media: Water spray or fog or special mixtures of dry chemicals.

Solubility in Water: Insoluble
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Solid: <.00001 ATM @ 68°F
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: If by-product sulfur, liquid form may contain up to 150 ppm H_2S unless specified lower. Vapor space in storage tanks, tank trucks or rail cars for molten sulfur may contain lethal quantities of H_2S and may be explosive.
Incompatibility (Material to Avoid): Oxidizing agents, insoluble in water and acids; attached by alkalies. Very soluble in carbon disulfide; various solubilities in organic liquids.
Hazardous Decomposition Products: Sulfur dioxide, hydrocarbons and temperatures above 212°F may release H_2S (toxic; and if more than 3.3 vol.% in air, explosive).
Hazardous Polymerization: Will not occur
Conditions to Avoid: Not applicable

SECTION 11 TOXICOLOGY INFORMATION

Inhalation: TLV Sulfur dust: 10mg/M^3 respirable dust. For H_2S: 10 ppm (15mg/M^3). For SO_2: 5 ppm (13mg/M^3).

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Consult an expert on disposal of recovered material and insure conformity to local disposal regulation.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Sulfur, Molten, 9, NA2448, P.G. III
Hazard Class: Class 9
Reportable Quantity (RQ): None
Labels Required: Class 9
Placard: Class 9

Packaging Group: None
C.A.S. Number: 7704-34-9
D.O.T. Number: NA2448
Haz Waste No: None
EPA Regist No: None

Refer to 49 CFR Hazardous Materials Table for further provisions, packaging authorizations and quantity limitations.

SECTION 15 REGULATORY INFORMATION

Carcinogenicity: by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Other precautions:
For liquid sulfur, 260°F - 320°F is recommended, as viscosity is low in this range. Maximum safe temperature is probably about 392°F. Vapor space of tanks, truck trailers, and rail cars in liquid sulfur service may contain lethal quantities of hydrogen sulfide gas (H_2S) and may be explosive. Exercise caution in opening the hatch and use positive pressure air supplied breathing apparatus.

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Pure: 370°F TOC, Impure: 335°F TOC
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME)	LOWER	UPPER
H_2S	3.3	46.0

Hazard Rating (N.F.P.A.): **Health:** 2 **Fire:** 1 **Reactivity:** 0 **Specific:** Not applicable
This N.F.P.A. rating is a recommendation by the manufacturer using the guidelines or published evaluations prepared by the National Fire Protection Association (N.F.P.A.).

MSDS Version Number: 3 (revisions to Section 15)

Reviewed by: The Department of Regulatory Affairs
July 1999 (208) 238-2700

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Ammonium Sulfate Regular
Registration No: None

M11070

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Ammonium Sulfate Regular
Common Name: Ammonium Sulfate 21-0-0
Chemical Type: Salt

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
None			Hazardous		
Ammonium Sulfate	7783-20-2	$(NH_4)_2SO_4$	Non-Hazardous 100	10 mg/M^3 - Nuisance Dust	Not available

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Small doses may cause mild discomfort. Used as a general purpose food additive for buffer and neutralizing agent.
Inhalation: Slight discomfort possible--causes readily reversible changes which disappear after end of exposure. Dust may cause further aggravation to those predisposed to respiratory problems.
Eye Contact: Slight eye abrasion possible.
Skin Absorption: Prolonged contact may cause slight skin abrasion.
Skin Contact: Slight abrasion possible.
Effects of Overdose: One reference lists that massive doses ingested or large doses administered under the skin, or in the blood stream, may cause diarrhea, and there arises the possibility of sufficient absorption to produce diuresis and systemic ammonia poisoning. Another reference lists unknown--no information on humans considered valid by authors.

SECTION 4 FIRST AID MEASURES

Ingestion: If ingested in large amount, give 2-3 glasses of water and induce vomiting. Call a doctor.
Inhalation: Should cause no problems by inhalation.
Eyes: Flush eyes with running water for 15 minutes. Seek medical attention if condition persists.
Skin: Wash skin with mild soap and water. Seek medical attention if condition persists.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Used in a solution as a fire retardant and to fight fires. Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Use media suitable to extinguish source of fire.
Unusual Fire and Explosion Hazards: Releases NH_3 and Sulfur Oxides when decomposing. If accidentally mixed with oxidizers it will sensitize these materials and make them more reactive under fire conditions.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of waterways and all bodies of water. Do not contaminate any body of water by direct application, cleaning of equipment or disposal. Since Ammonium Sulfate is a fertilizer, it may promote algae growth in waterways.
Steps to be taken in case material is released or spilled: Contain spill. Sweep up and scoop into suitable container for use or recycle. May be used as a fertilizer using good agronomic practices.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing: Avoid prolonged contact with skin. Use dust mask if material is dusty. Separate from strong oxidizers such as chlorates, nitrates and nitrites.
Other Precautions: Store in cool, dry area--preferably on pallets off of floor.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation for bulk storage.
Respiratory Protection: Use dust mask if material is dusty.
Protective Clothing: Normal clean work clothing. Gloves as needed.
Eye Protection: Safety glasses with side shield.
Other: Eyewash fountain in area.

Trade Name: Ammonium Sulfate Regular
Registration No: None

M11070

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

...g Point: Decomposed @ 455°F
...sity: 66-69 lbs/ft^3
Flashpoint: Non-flammable
pH: 10 g/90 g H_2O: 5.5 - 6.0
Appearance: White or off-white crystals.
Reaction with Water: None
Extinguishing Media: Non-flammable. Used in a solution for fighting fires.

Solubility in Water: 70g/100g H_2O cold, 100g/100g H_2O hot
% Volatiles (by volume): 0
Vapor Pressure, mm Hg: Nil
Evaporation Rate: Not available
Specific Gravity: 1.1
VOC: Not available

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: None
Incompatibility (Material to Avoid): Oxidizers.
Hazardous Decomposition Products: Releases NH_3 and Sulfur Oxide fumes when decomposing.
Hazardous Polymerization: Will not occur

SECTION 11 TOXICOLOGY INFORMATION

Acute Oral Toxicity: LD_{50} (rat) is 640-4,250 mg/kg; not acutely toxic by oral exposure. (TFI Product Testing Results, OECD Guideline 425)
Acute Dermal Toxicity: LD_{50} (rat) is greater than 2,000 mg/kg (ppm); not acutely toxic by dermal exposure. (TFI Product Testing Results, OECD Guideline 402).
Acute Aquatic Toxicity: Fish 96-hour LC_{50} is greater than 13.6-159.8 mg total NH_3/L; daphnia 96-hour LC_{50}: greater than 27 mg total NH_3/L. Slightly-toxic to aquatic organisms. (TFI Product Testing Results)

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Use or recycle. As the product is a fertilizer, use as fertilizer following good agronomic practices or consult local authorities.

SECTION 14 TRANSPORT INFORMATION

...pping name: Not regulated by D.O.T.
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None

C.A.S. Number: 7783-20-2
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:
by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X) by OSHA Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME)	LOWER	UPPER
	N/A	N/A

Hazard Rating (N.F.P.A.): **Health:** 2 **Fire:** 1 **Reactivity:** 0 **Specific:** Not applicable
This N.F.P.A. rating is a recommendation by the manufacturer using the guidelines or published evaluations prepared by the National Fire Protection Association.

MSDS Version Number: 4 (revisions to Section 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 238-2700

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Urea Fertilizer 46-0-0 **M11020**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Urea Fertilizer 46-0-0
Common Name: 46-0-0
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
None listed			**Hazardous**		
			Non-Hazardous		
Urea	57-13-6	$CO(NH_2)_2$	98.7	NE	Not available
Non-hazardous ingredients			1.3		

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled:
Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

Trade Name: Urea Fertilizer 46-0-0
Registration No: None

M11020

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not applicable
Specific Gravity: 1.335
Flashpoint: Non-flammable
pH: Not listed
Appearance: White prills or granules.
Extinguishing Media: Use media suitable to extinguish source of fire.

Solubility in Water: 67 gm/100 gm H_2O @ 32°F
% Volatiles (by volume): 0
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: Extremely high temperatures.
Incompatibility (Material to Avoid): Strong oxidizing agents. Prolonged contact may cause oxidation of unprotected metals.
Hazardous Decomposition Products: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.
Hazardous Polymerization: Will not occur

SECTION 11 TOXICOLOGY INFORMATION

Acute Oral Toxicity: LD_{50} (rat) is 14,300 mg/kg (ppm); not acutely toxic by oral exposure. (TFI Product Testing Results)
Acute Aquatic Toxicity: Fish 96-hour LC_{50} is greater than 9,100 mg/L (ppm); daphnia 24-hour EC_{50}: greater than 10,000 mg/L. Non-toxic to aquatic organisms. (TFI Product Testing Results)

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Pick up with a shovel and broom and use as a fertilizer by applying to soil using good agricultural and soil management.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by DOT
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None

C.A.S. Number: 57-13-6
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity: by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME) LOWER N/A UPPER N/A

MSDS Version Number: 4 (revisions to Section 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 672-2700

PURSELL
INCORPORATED 1902

Title: TriKote Polymer Coated Sulfur Coated Urea Regular, Mini, Micro

T.I. No.: PD-10-3

Date: March 6, 1996

Supersedes Date: May 27, 1995

PURSELL INDUSTRIES, INC. ■ P.O. BOX 540 ■ 201 W. FOURTH ST. ■ SYLACAUGA, ALABAMA 35150
USA AND CANADA 1-800/334-8583 ■ 205/249-6818 ■ FAX 205/249-7428

Product Name: TriKote ™ Polymer coated Sulfur Coated Urea
Regular, Mini, Micro

Label Guarantees:

	Regular	Mini	Micro
Total Nitrogen (N)	42%	41%	30%
42% (Reg.), 41% (Mini), 30% (Micro) Urea (N)*			
Secondary Nutrients			
Sulfur (S) (free)	5%	5%	25%

Source of Nutrients: Polymer coated Sulfur coated urea

* 38.0% (Reg.), 37.0% (Mini), 27.0% (Micro) Slowly Available Urea Nitrogen from Sulfur Coated Urea as manufactured, per AOAC 970.04 test method (see reverse).

Screen Analysis (Typical) and Size Guide Number (SGN):

Size	US Std Sieve	SGN
Regular	-6+12	239
Mini	-10+16	180
Micro	-14+35	95

	Regular	Mini	Micro
Bulk Density - lbs/cu ft	46-47	46-47	47-48
Angle of Repose - degrees	30	30	30

Caution: The use of high speed bucket elevators, contact paddle blenders, drag lines, augers, or other rough or abusive handling or application equipment can break or abrade the sulfur coating, causing reduction in release control and a corresponding increase in the dissolution rate of urea. To determine the abrasion effect that unloading/blending/spreading equipment has, it is recommended that inspection samples of blended product be tested for CSR-N at routine intervals to support specific label claims on blended products for coated slow release urea nitrogen. **Pursell Industries neither recommends nor endorses the use of PCSCU's as nitrogen sources in products for container nursery stock.**

(over)

™ TriKote is a trademark of Pursell Industries, Inc.

MSDS on Following Pages

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Trikote Minis 41-0-0
Registration No: None

M74101

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
PO Box 70013
Boise, ID 83707
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Trikote Minis 41-0-0
Common Name: 41-0-0
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT% Hazardous	TLV	PEL
None listed					
Urea	57-13-6	NH_2CONH_2	72	Not listed	Not available
Sulfur	7704-34-9	S	25	2 mg/M^3	Not available
Paraffin Wax	8002-74-2	–	3	Not listed	Not listed

Non-Hazardous

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems. Sulfur is not considered toxic by ingestion in normal amounts.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Sulfur dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled: Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing: Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

nu-gro
Nu-Gro Technologies, Inc.
2680 Horizon Drive SE
Suite F5
Grand Rapids, MI 49546
1-888-370-1874

Product Description

NITROFORM® Blue Granular® Ureaform Fertilizer 38-0-0

Description: Nitroform® 38-0-0 Blue Granular®

Nitroform® is a slow release nitrogen fertilizer formed by reacting urea and formaldehyde into a series of high-molecular-weight methyleneurea polymers. Collectively, they are known as ureaform. The nitrogen in Nitroform® is released over 24-36 weeks and beyond, primarily by microbial breakdown. Nitroform® may be used in direct application or blended with other nutrients.

Analysis:

	Specification	Typical
Total Nitrogen	38.0%	38.4 %
Urea Nitrogen		4.5 %
Slowly Available Water Soluble Nitrogen*		6.9 %
Water Insoluble Nitrogen	26.6%	27.3 %

Controlled Release Nitrogen (AOAC 945.01 Method)	88.0%	(% of Total N)

*Slowly Available Nitrogen from Ureaform

Typical Physical Properties:

Screen Size: U.S. Standard Screen- ASTM E-726/E-11

U.S. Standard No.	mm	Cumulative % Retained
# 6+	3.35	< .20%
# 8+	2.36	30.0 - 45.0%
#10+	2.00	60.0 - 75.0%
#14+	1.40	95.0 - 99.0%
#20+	.85	97.0 - 100.0%
-20		< 2.0

SGN: (Size Guide Number) = 210 - 225 **Uniformity Index (UI)** = 48
Density: 48 lbs. per cu. ft. (769 kg. per cubic meter)
Angle of Repose: 39 degrees

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Nu-Gro Technologies NITROFORM (All Grades)

Date Prepared: 08/08/96 **Date Revised:** 06/20/01

Section 1: CHEMICAL PRODUCT AND COMPANY INFORMATION

CHEMICAL NAME: Ureaform SYNONYM(S): Urea formaldehyde

Manufactured For: **Nu-Gro Technologies, Inc.**
2680 Horizon Dr.SE F-5
Grand Rapids MI 49546

Emergency Telephone: **1-905-572-5678 (CAN)**
Non Emergency Telephone: **1-888-370-1874 (USA)**

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

This product is not considered hazardous under The Hazard Communication Standard 29 CFR 1910.1200 although it does contain the following materials:
Ureaform (CAS No. 9011-05-6).

OSHA Nuisance dust limit of 15mg/M^3 (total) and 5mg/M^3 (respirable) & ACGIH Nuisance dust limit of 10mg/M^3 (inhalable) and 3mg/M^3 (respirable) may apply to this product.

Section 3: HAZARDS IDENTIFICATION

Primary routes of entry: _x_ skin _x_ eye _x_ inhalation _x_ ingestion

SIGNS & SYMPTOMS OF EXPOSURE: Acute: May be a mild skin or eye irritant. Ingestion may cause gastrointestinal tract disorders, nausea, diarrhea or vomiting. Chronic: None known.

Section 4: FIRST AID MEASURES

Eyes: Flush promptly with plenty of water for at least 15 minutes.
Skin: Wash affected area promptly with soap and water.
For eye or skin contact, see a physician if irritation develops.
Inhalation: Remove to fresh air.
Ingestion: If patient is conscious, give 2 to 4 glasses of water to drink and induce vomiting by touching back of throat with finger. Consult a physician. Do not attempt to induce vomiting or give anything by mouth to an unconscious person.

Note(s) to physician: No specific antidote (product may be a mild skin or eye irritant). Supportive care and symptomatic treatment may be given.

Medical Conditions Aggravated by Exposure: Possible skin irritation for sensitive individuals. Asthmatics exposed to excessive dust may have difficulty breathing.

NITROFORM (All grades)

Section 5: FIRE FIGHTING MEASURES

Flash Point(Method): NA LEL: ND UEL: ND
EXTINGUISHING MEDIA: __Foam _x_Water Spray __Alcohol Foam ___CO_2

Special Fire Fighting Procedures: Do not breathe fumes. Firefighters should wear NIOSH approved positive pressure, self-contained breathing apparatus. Prevent runoff from entering drains, sewers or any body of water. Fertilizer will become slippery when wet; guard against falls. Remove product from area of fire at first opportunity.

Unusual Fire & Explosion Hazards: Do not breathe fumes. If heated to decomposition, product will give off fumes of ammonia and formaldehyde. Fine dust dispersion in air may form an explosive mixture.

Section 6: ACCIDENTAL RELEASE MEASURES

IF MATERIAL IS SPILLED: Wear proper protective equipment (see Section 8). Sweep, vacuum or shovel material into labeled container with minimum generation of dust for reuse or disposal. Ensure that disposal is in compliance with local, state or federal regulations. Do not allow product to contaminate any body of water. Prevent large quantities from contacting vegetation.

Section 7: HANDLING & STORAGE

Handling: Avoid contact with skin, eyes and clothing. Do not take internally. Avoid breathing dust. Do not eat, drink or smoke while handling product. Wash after handling. Do not apply directly to waters. Do not contaminate water by disposal of equipment washwaters.

Storage: Store in a cool, dry area out of reach of children and animals. Do not store where temperatures will exceed 270E F.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective equipment suggested for outdoor applications:
_x_Impervious gloves _x_Eye Goggles/Safety Glasses _x_Clean Clothing
Protective Equipment Suggested for Confined Areas:
_x_Sufficient Ventilation _x_Dust Mask _x_Safety Glasses

Section 9: PHYSICAL & CHEMICAL PROPERTIES

Packing Density: 40-50 lbs/cu ft. Solubility in Water: moderate.
Appearance & Odor: blue or gray granules, chips or powder; no odor.

Section 10: STABILITY & REACTIVITY

Stability: Stable. Conditions to Avoid: Excessive heat; absorbs moisture above 60% relative humidity.
Incompatibility: Moderately corrosive to metals when wet.
Hazardous Decomposition Products: If heated to decomposition, will give off toxic fumes of ammonia and formaldehyde. Hazardous Polymerization: Will Not Occur.

Nitroform (All grades)

Section 11: TOXICOLOGICAL INFORMATION

TOXICITY DATA: ORAL (acute): LD_{50} (rat)= >10,000 mg/kg (low toxicity).
DERMAL (acute): ND by laboratory tests; (may be mild eye or skin irritant).
INHALATION (acute): LC_{50}(rat; 4 hrs.)= ND. (Product is expected to have low or no toxicity).

Positive Teratogen/Mutagen/Carcinogen (NTP): NO. Potential Carcinogen OSHA/IARC: NO.

Section 12: ECOLOGICAL INFORMATION

Toxic to: ___fish ___birds ___wildlife _x__other: keep out of any body of water.

Section 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method(s): Dispose according to USEPA guidelines as outlined in RCRA. Follow state and local regulations. Be certain bag is completely empty before disposal.
Ureaform is not a RCRA listed chemical.

Section 14: TRANSPORTATION INFORMATION

DOT Shipping Information: not regulated.
SEC. 302: NA SEC. 304: NA SEC. 313: NA CERCLA: NA CAA: NA
TSCA: Ureaform (CAS No. 9011-05-6) is a listed chemical under TSCA.

Section 15: REGULATORY INFORMATION

SARA Information: SARA TITLE III; SEC.311/312 HAZARD CATEGORIES
N Immediate (Acute) Health N Sudden Release of Pressure
N Delayed (Chronic) Health N Reactivity N Fire

Section 16: OTHER REGULATORY INFORMATION

	HMIS HAZARD RATING	NFPA HAZARD RATING
Health	1 slight	1 slight
Fire	1 slight	1 slight
Reactivity	0 negligible	0 negligible
PPE	E	NA
Spec.Haz.	NA	None

State Right-to-Know (RTK) Hazardous Substance: Ureaform is not known to be a hazardous/regulated compound in any state regulations. Check with specific state authorities since regulations vary within the states.

Section 17: OTHER INFORMATION

Format complies with ANSI Z400.1 requirements. Revisions of 06/20/01 to Sections 1, 2, 5, 13,14 &15.

nu-gro
Nu-Gro Technologies, Inc.
2680 Horizon Drive SE
Suite F5
Grand Rapids, MI 49546
1-888-370-1874

Product Description

NUTRALENE®

Green Granular 40-0-0

Description: Nutralene® 40-0-0 Green Granular

Nutralene® is a controlled release nitrogen fertilizer formed by reacting urea and formaldehyde into a series of lower-molecular-weight methyleneurea polymers. The nitrogen in Nutralene® is released over 12 to 16 weeks through hydrolysis and microbial breakdown. Nutralene® may be used in direct application or blended with other nutrients.

Analysis:

	Specification	Typical
Total Nitrogen	40.0%	40.2%
Urea Nitrogen		6.0%
Slowly Available Water Soluble Nitrogen*		20.0%
Water Insoluble Nitrogen	14.0%	15.7%
Controlled Release Nitrogen (AOAC 970.04 Method)	85.0%	(% of Total N)

*Slowly Available Nitrogen from Methylene Urea

Typical Physical Properties:

Screen Size: U.S. Standard Screen- ASTM E-726/E-11

U.S. Standard No.	mm	Cumulative % Retained
#6	3.35	<1.0%
#8+	2.36	30.0 - 45.0%
#10+	2.00	60.0 - 75.0%
#14+	1.40	95.0 - 99.0%
#20+	.85	97.0 - 100.0%
-20		<2.0%

SGN: (Size Guide Number) = 210 - 225 **Uniformity Index (UI)** = 46
Bulk Density: 44 lbs. per cu. ft. (705 kg. per cubic meter)
Angle of Repose: 36

MATERIAL SAFETY DATA SHEET

PRODUCT NAME: Nu-Gro Technologies NUTRALENE (All Grades)

Date Prepared: 08/08/96 **Date Revised:** 06/20/01

Section 1: CHEMICAL PRODUCT AND COMPANY INFORMATION

CHEMICAL NAME: Methylene ureas SYNONYM(S): NA

Manufactured For: **Nu-Gro Technologies, Inc.**
2680 Horizon Dr.SE F-5
Grand Rapids MI 49546

Emergency Telephone: **1-905-572-5678 (CAN)**
Non Emergency Telephone: **1-888-370-1874 (USA)**

Section 2: COMPOSITION/INFORMATION ON INGREDIENTS

This product is not considered hazardous under The Hazard Communication Standard 29 CFR 1910.1200 although it does contain the following materials:
Methylene ureas (CAS No. 9011-05-6) and Pigments (trade secret).

OSHA Nuisance dust limit of 15mg/M^3 (total) and 5mg/M^3 (respirable) & ACGIH Nuisance dust limit of 10mg/M^3 (inhalable) and 3mg/M^3 (respirable) may apply to this product.

Section 3: HAZARDS IDENTIFICATION

Primary routes of entry: _x_skin _x_eye _x_inhalation _x_ingestion

SIGNS & SYMPTOMS OF EXPOSURE: Acute: May be a skin or eye irritant. Ingestion may cause gastrointestinal tract disorders, nausea, diarrhea or vomiting. Chronic: None known.

Section 4: FIRST AID MEASURES

Eyes: Flush promptly with plenty of water for at least 15 minutes.
Skin: Wash affected area promptly with soap and water.
For eye or skin contact, see a physician if irritation develops.
Inhalation: Remove to fresh air.
Ingestion: If patient is conscious, give 2 to 4 glasses of water to drink and induce vomiting by touching back of throat with finger. Consult a physician. Do not attempt to induce vomiting or give anything by mouth to an unconscious person.

Note(s) to physician: No specific antidote (product may be a mild skin or eye irritant). Supportive care and symptomatic treatment may be given.

Medical Conditions Aggravated by Exposure: Possible skin irritation for sensitive individuals. Asthmatics exposed to excessive dust ma have difficulty breathing.

NUTRALENE (All Grades)

Section 5: FIRE FIGHTING MEASURES

Flash Point(Method): NA LEL: ND UEL: ND
EXTINGUISHING MEDIA: x Foam x Water Spray x Dry powder x CO_2

Special Fire Fighting Procedures: Do not breathe fumes. Firefighters should wear NIOSH approved self-contained breathing apparatus. Prevent runoff from entering drains, sewers or any body of water. Fertilizer will become slippery when wet; guard against falls. Remove product from area of fire at first opportunity.

Unusual Fire & Explosion Hazards: Do not breathe fumes. If heated to decomposition, product will give off fumes of ammonia, cyanic acid and carbon dioxide. Fine dust dispersion in air may form an explosive mixture.

Section 6: ACCIDENTAL RELEASE MEASURES

IF MATERIAL IS SPILLED: Wear proper protective equipment (see Section 8). Sweep, vacuum or shovel material into labeled container with minimum generation of dust for reuse or disposal. Ensure that disposal is in compliance with local, state or federal regulations. Do not allow product to contaminate any body of water. Prevent large quantities from contacting vegetation.

Section 7: HANDLING & STORAGE

Handling: Avoid contact with skin, eyes and clothing. Do not take internally. Avoid breathing dust. Do not eat, drink or smoke while handling product. Wash after handling. Do not apply directly to waters. Do not contaminate water by disposal of equipment washwaters.

Storage: Store in a cool, dry area out of reach of children and animals. Do not store where temperatures will exceed 270E F.

Section 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

Protective equipment suggested for outdoor applications:
x Impervious gloves x Eye Goggles/Safety Glasses x Clean Clothing

Protective Equipment Suggested for Confined Areas:
x Sufficient Ventilation x Dust Mask x Safety Glasses

Section 9: **PHYSICAL & CHEMICAL PROPERTIES**

Packing Density: 46 lbs/cu ft. Solubility in Water: 66% Appearance & Odor: Odorless granules.

Section 10: **STABILITY & REACTIVITY**

Stability: Stable. Conditions to Avoid: Excessive heat; absorbs moisture above 60% relative humidity. Incompatibility: Moderately corrosive to metals when wet. Hazardous Decomposition Products: If heated to decomposition, will give off toxic fumes of ammonia, cyanic acid and carbon dioxide. Hazardous Polymerization: Will Not Occur.

NUTRALENE (All Grades)

Section 11: TOXICOLOGICAL INFORMATION

TOXICITY DATA: ORAL (acute): ND by laboratory tests; a similar product showed LD_{50} (rat)= >10,000 mg/kg (low toxicity). DERMAL (acute): ND by laboratory tests; (not known to be an eye or skin irritant). INHALATION (acute): LC_{50}(rat; 4 hrs.)= ND. (Product is expected to have low or no toxicity).

Positive Teratogen/Mutagen/Carcinogen (NTP): NO. Potential Carcinogen OSHA/IARC: NO.

Section 12: ECOLOGICAL INFORMATION

Toxic to: ___fish ___birds ___wildlife _x_other: keep out of any body of water.

Section 13: DISPOSAL CONSIDERATIONS

Waste Disposal Method(s): Dispose according to USEPA guidelines as outlined in RCRA. Follow state and local regulations. Be certain bag is completely empty before disposal. Ureaform is not a RCRA listed chemical.

Section 14: **TRANSPORTATION INFORMATION**

DOT Shipping Information: not regulated.
SEC. 302: NA SEC. 304: NA SEC. 313: NA CERCLA: NA CAA: NA
TSCA: Methylene urea (CAS No. 9011-05-6) and pigments are listed chemicals under TSCA.

Section 15: REGULATORY INFORMATION

SARA Information: SARA TITLE III; SEC.311/312 HAZARD CATEGORIES
_N_ Immediate (Acute) Health _N_ Sudden Release of Pressure
_N_ Delayed (Chronic) Health _N_ Reactivity _N_ Fire

Section 16: OTHER REGULATORY INFORMATION

	HMIS HAZARD RATING	NFPA HAZARD RATING
Health	1 slight	1 slight
Fire	1 slight	1 slight
Reactivity	0 negligible	0 negligible
PPE	E	NA
Spec.Haz.	NA	None

State Right-to-Know (RTK) Hazardous Substance: Methylene ureas are not known to be a hazardous/regulated compound in any state regulations. Check with specific state authorities since regulations vary within states.

Section 17: OTHER INFORMATION

Format complies with ANSI Z400.1 requirements. Revisions of 06/20/01: Sections 1, 2 & 8.

NUTRALENE (All Grades)

DISCLAIMER: This information relates to the specific material designated and may not be valid for such material used in combination with any other materials or in any process. Such information is to the best of our knowledge and belief, accurate and reliable as of the date compiled. However, no representation, warranty or guarantee is made as to its accuracy, reliability or completeness. ***NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY, EXPRESS OR IMPLIED, MADE AS CONCERNS THE INFORMATION HEREIN PROVIDED.*** It is the user's responsibility to satisfy himself as to the suitability and completeness of such information for his own particular use. We do not accept liability for any loss or damage that may occur from the use of this information nor do we offer warranty against patent infringement.

NA=Not Applicable; ND=Not Determined; NIA=No Information Available

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: 11-52-0 Mono-Ammonium Phosphate **M14010**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 70013
Boise, ID 83707
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: 11-52-0 Mono-Ammonium Phosphate
Common Name: 11-52-0
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
			Hazardous		
None listed					
			Non-Hazardous		
Mono-Ammonium Phosphate	7722-76-1	$NH_4H_2PO_4$	100	10 mg/M^3 - Nuisance Dust	Not available

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled:
Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

Trade Name: 11-52-0 Mono-Ammonium Phosphate **M14010**
Registration No: None

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not applicable
Density: 63 lbs/ft^3
Flashpoint: Non-flammable
pH: Not listed
Appearance: Not applicable
Extinguishing Media: Use media suitable to extinguish source of fire.

Solubility in Water: 40 gm/100gm H_2O (pure)
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: Extremely high temperatures.
Incompatibility (Material to Avoid): Strong oxidizing agents. Prolonged contact may cause oxidation of unprotected metals.
Hazardous Decomposition Products: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.
Hazardous Polymerization: Will not occur
Conditions to Avoid: Not applicable

SECTION 11 TOXICOLOGY INFORMATION

Acute Dermal Toxicity: LD_{50} (rat) is greater than 5,000 mg/kg (ppm); not acutely toxic by dermal exposure. (TFI Product Testing Results, OECD Guideline 402).
Acute Oral Toxicity: LD_{50} (rat) is greater than 2,000 mg/kg (ppm); not acutely toxic by oral exposure. (TFI Product Testing Results, OECD Guideline 425)
Acute Fish Toxicity: 96-hour LC_{50} is greater than 85.9 mg/L (ppm); low acute toxicity. (TFI Product Testing Results, OECD Guideline 203)

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Pick up with a shovel and broom and use as a fertilizer by applying to soil using good agricultural and soil management.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by DOT
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None

C.A.S. Number: 7722-76-1
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:
by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME) **LOWER** N/A **UPPER** N/A

MSDS Version Number: 4 (revisions to Section 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 672-2700

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: 18-46-0 Di-Ammonium Phosphate **M14000**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 70013
Boise, ID 83707
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: 18-46-0 Di-Ammonium Phosphate
Common Name: 18-46-0
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
			Hazardous		
None listed					
			Non-Hazardous		
Di-Ammonium Phosphate	7783-28-0	$(NH_4)_2HPO_4$	100	10 mg/M^3 - Nuisance Dust	Not available
Inert Ingredients					

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled:
Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

Trade Name: 18-46-0 Di-Ammonium Phosphate
Registration No: None

M14000

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not applicable
Density: 62 lbs/ft^3
Flashpoint: Non-flammable
pH: 1 gm/10 gm H_2O: 7-8
Appearance: Green granules.
Extinguishing Media: Use media suitable to extinguish source of fire.

Solubility in Water: Complete
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: Extremely high temperatures.
Incompatibility (Material to Avoid): Strong oxidizing agents. Prolonged contact may cause oxidation of unprotected metals.
Hazardous Decomposition Products: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.
Hazardous Polymerization: Will not occur

SECTION 11 TOXICOLOGY INFORMATION

Acute Dermal Toxicity: LD_{50} (rat) is greater than 5,000 mg/kg (ppm); not acutely toxic by dermal exposure. (TFI Product Testing Results, OECD Guideline 402).
Acute Oral Toxicity: LD_{50} (rat) is greater than 2,000 mg/kg (ppm); not acutely toxic by oral exposure. (TFI Product Testing Results, OECD Guideline 425)
Acute Algae Toxicity: 96-hour LC_{50} is greater than 97.1 mg/L (ppm). Stimulation of growth was observed at 6.41 mg/L and higher. DAP is not toxic to algae but can stimulate algal growth. (TFI Product Testing Results, OECD Guideline 203)

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Pick up with a shovel and broom and use as a fertilizer by applying to soil using good agricultural and soil management.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by DOT
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None

C.A.S. Number: 7783-28-0
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:
by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME)	LOWER	UPPER
	N/A	N/A

MSDS Version Number: 4 (revisions to Section 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 672-2700

MATERIAL SAFETY DATA SHEET

GTSP – Granular Triplesuperphosphate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	GTSP—Granular Triplesuperphosphate
Chemical Name:	Monocalcium Orthophosphate
Chemical Family:	Inorganic Salt
Synonyms/Brands:	GTSP, 0-46-0, Triple, Calcium Phosphate Monobasic, Acid Calcium Phosphate
Chemical Formula:	$CaH_2PO_4H_2O$
Primary Use:	Crop nutrient
Responsible Party:	IMC Phosphates Company 100 Saunders Road Suite 300 Lake Forest, IL 60045
Non-Emergency Technical Contact:	8:00am - 4:00pm Central Time, Mon - Fri: 800-323-5523 or 847-739-1200

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Number:

For Chemical Emergencies:

Spill, Leak, Fire or Accident

Call CHEMTREC

North America: (800)424-9300

Others: (703)527-3887 (collect)

Health Hazards:	May cause severe eye burns. Keep container tightly closed. Use ventilation adequate to keep exposures below recommended limits (see Section 2). Do not get in eyes. Wear appropriate eye protection. Wash thoroughly after handling.
Physical Hazards:	Slippery when wet.
Physical Form:	Solid.
Appearance:	Gray, tan or black granules.
Odor:	Slight.

NFPA HAZARD CLASS		**HMIS HAZARD CLASS**	
Health:	2 (Minor)	Health:	2 (Minor)
Flammability:	0 (Least)	Flammability:	0 (Least)
Instability: Special	0 (Least)	Reactivity:	0 (Least)
Hazard:	None	PPE:	Section 8

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	% Weight	Exposure Guideline		
		Limits	Agency	Type
Calcium Phosphate Monobasic CAS No. 7758-23-8	95 - 98	NE	OSHA ACGIH	All
Iron, Aluminum and Magnesium Sulfates and Silicates CAS No. (various)	2 - 5	NE	OSHA ACGIH	All

NE= Not established, but the following particulate limits apply to all inert inorganic dusts.

Particulates Not Otherwise Classified (PNOC)	10 mg/m^3 3 mg/m^3	ACGIH ACGIH	TWA-Inhalable TWA-Respirable
Particulates Not Otherwise Regulated (PNOR)	15 mg/m^3 5 mg/m^3	OSHA OSHA	TWA-Total Dust TWA-Respirable

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS	
Eye:	Prolonged contact may cause severe eye irritation, eye burns, and permanent eye damage.
Skin:	Contact may cause irritation including redness and a burning sensation. No harmful effects from skin absorption have been reported.
Inhalation (Breathing):	No information available. Studies by other exposure routes suggest a low degree of hazard by inhalation.
Ingestion (Swallowing):	Low degree of toxicity by ingestion.
Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, and diarrhea.
Cancer:	No data available.
Target Organs:	No data available.
Developmental:	No data available.
Other Comments:	This material contains iron compound(s) of various composition. Effects of overexposure to dusts can include irritation of the eyes and respiratory tract, pneumoconiosis (dust congested lungs) pneumonitis (lung inflammation), coughing, vomiting, diarrhea, abdominal pain and jaundice.
Pre-Existing Medical Conditions:	None known

4. FIRST AID MEASURES

Eye:	Immediately move victim away from exposure and into fresh air. If irritation or redness develops, flush eyes with clean water and seek immediate medical attention. For direct contact, immediately hold eyelids apart and flush the affected eye(s) with clean water for at least 30 minutes. Seek immediate medical attention.
Skin:	Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.
Inhalation (Breathing):	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
Ingestion (Swallowing):	First aid is not normally required; however, if swallowed and symptoms develop, seek medical attention.
Note to Physicians:	None known

5. FIRE FIGHTING MEASURES

Flammable Properties:	Flash Point—Not applicable OSHA Flammability Class—Not applicable LEL/UEL—Not applicable Autoignition Temperature—Not applicable
Unusual Fire & Explosion Hazards:	No unusual fire or explosion hazards are expected.
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire. Avoid excessive water to minimize runoff.
Fire Fighting Instructions:	For fires beyond the incipient stage, emergency responders in the immediate hazard area should wear bunker gear. When the potential hazard is unknown, in enclosed or confined spaces, a self-contained breathing apparatus should be worn. In addition, wear other appropriate protective equipment as conditions warrant (see Section 8). Cool equipment exposed to fire with water, if it can be done with minimal risk. Avoid excessive water to minimize runoff.

6. ACCIDENTAL RELEASE MEASURES

GTSP is a crop nutrient and plant food; however, large spills can harm or kill vegetation.

- Stay upwind and away from spill (dust hazard). Minimize dust generation.
- Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).
- Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways.
- Notify appropriate federal, state, and local agencies as may be required.
- Sweep up and package appropriately for disposal.

7. HANDLING AND STORAGE

Handling:	Use of appropriate respiratory protection is advised when concentrations exceed established exposure limits (see Sections 2 and 8). Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.
Storage:	When possible store this material in cool, dry, well-ventilated areas to protect product quality. Keep container(s) tightly closed. Store only in approved containers, if applicable. Keep away from any incompatible materials (see Section 10). Protect container(s) against physical damage.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE)	
Respiratory:	A NIOSH approved air purifying respirator with a type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2). Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed if workplace conditions warrant a respirator.

Personal Protective Equipment (PPE)	
Skin:	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption (see glove manufacturer literature for information on permeability).
Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended. Depending on conditions of use, a face shield may be necessary.
Other PPE:	A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Flash Point:	Not applicable
Flammable/ Explosive Limits (%):	LEL/UEL: Not applicable
Autoignition Temperature:	Not applicable
Appearance:	Tan to black
Physical State:	Solid
Odor:	Slight
Molecular Weight of Pure Material:	252.07
pH:	2.5 – 2.8 in a 1% solution
Vapor Pressure (mm Hg):	Not applicable
Vapor Density (air=1):	Not applicable
Boiling Point:	Decomposes
Freezing/Melting Point:	288°F / 142°C
Solubility in Water:	1 lb/gallon / 0.12 kg/litre
Specific Gravity:	2.17 - 2.27 (Water = 1)
Volatility:	No data available
Bulk Density:	68-72 lbs/ft^3 (1090-1150 kg/m^3)

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of storage and handling.
Conditions to Avoid:	None known.
Incompatible Materials:	None known.
Hazardous Decomposition Products:	None known.
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Calcium Phosphate Monobasic	Rat LD50 = 17,500 mg/kg
Iron Compounds/ Target Organ(s):	Chronic exposure to high concentrations of iron have been associated with hemosiderosis, hemochromatosis and in severe cases, liver cirrhosis. Typical occupational exposures to iron compounds are not expected to cause these effects. Chronic inhalation can produce "mottling" of the lungs (siderosis). This is considered a benign pneumoconiosis and does not normally lead to fibrosis or cause significant physiologic impairment.

12. ECOLOGICAL INFORMATION

Ecotoxicity:	May release phosphates which will result in algae growth, increased turbidity, and depleted oxygen. At extremely high concentrations, this may be hazardous to fish or other marine organisms. Release to watercourses may cause effects downstream.
BOD and COD:	No data found.

13. DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not an RCRA "listed" or "characteristic" hazardous waste. Contamination may subject it to hazardous waste regulations. Properly characterize all waste materials. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

Hazard Class or Division:	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) Regulations Canada.

15 REGULATORY INFORMATION

CERCLA:	No
RCRA 261.33:	No
SARA Title III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or quantities of less than 10,000 pounds on-site)	SARA 313 List: No
	SARA 311/312- Acute: Yes; Chronic: No; Fire: No; Pressure: No; Reactivity: No
	SARA 302/304 List- No
TSCA:	8(b) Chemical Inventory: Yes; TSCA 8(d): No
Proposition 65: (CA Health & Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.
NTP, IARC, OSHA:	This material has not been identified as a carcinogen by NTP, IARC, or OSHA.
Canada DSL:	Yes
Canada NDSL:	No
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16 OTHER INFORMATION

The information in this document is believed to be correct as of the date issued. **HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.** This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof.

IMC Global

GTSP Specifications			
Size Guide Number (SGN): 290 Uniformity Index (UI): 55			
Particle Size Distribution (% Cumulative)			
Tyler Mesh	Size (mm)	Range	Typical
+4	4.75	0-0.5	0.3
+5	4.00	3-4	3.8
+6	3.35	15-20	18.5
+8	2.36	83-88	84.2
+9	2.00	93-97	94.1
+10	1.70	96-99	97.7
+14	1.18	98-100	99.8
+16	1.00	99-100	99.9
-16	Fines	0-0.2	0.1
Physical Properties: (Typical)			
Bulk Density (Loose)		1,100.4 kg/m3 (or 68.7 lbs/ft3)	
Bulk Density (Packed)		1,172.5 kg/m3 (or 73.2 lbs/ft3)	
Angle of Repose		31-33 Degrees	
Hardness		5.4 kg (or 12 lbs)	
Chemical Analysis: (Typical)			
Phosphate (P_2O_5):			
Total		48.1%	
Available		46.1%	
Water Soluble		39.0%	
Citrate Insoluble		2.0%	
Crude Moisture (H_2O)		1.0%	
Sulfur (SO_4)		3.2%	
Iron (Fe_2O_3)		1.7%	
Aluminum (Al_2O_3)		1.6%	
Magnesium (MgO)		0.9%	
pH (1% Solution)		2.7	

Revise 12/00

Product analyses are typical as tested at minesite.
Handling and transportation may affect the analysis of the delivered product.

IMC Global Inc., 100 Saunders Road, Suite 300, Lake Forest, Illinois 60046
847-739-1200, Fax: 847-739-1620, www.imcglobal.com

Honeywell

Material Safety Data Sheet

SULF-N™ Ammonium Sulfate

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: SULF-N™ Ammonium Sulfate
OTHER/GENERIC NAMES: Ammonium sulfate; Diammonium sulfate.
PRODUCT USE: Fertilizer.

MANUFACTURER: Honeywell
101 Columbia Road
Morristown, New Jersey 07962

FOR MORE INFORMATION CALL:
(Monday-Friday, 8:00am-5:00pm)
1-800-707-4555

IN CASE OF EMERGENCY CALL:
(24 Hours/Day, 7 Days/Week)
1-800-707-4555 or Chemtrec 1-800-424-9300

2. COMPOSITION/INFORMATION ON INGREDIENTS

INGREDIENT NAME	CAS NUMBER	WEIGHT %
Ammonium Sulfate	7783-20-2	95

Trace impurities and additional material names not listed above may also appear in Section 15 toward the end of the MSDS. These materials may be listed for local "Right-To-Know" compliance and for other reasons.

3. HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: Colorless to dark brown crystals or granules. Odorless. Dust may cause irritation to skin, eyes, nose, throat and lungs. Avoid breathing dust.

POTENTIAL HEALTH HAZARDS

SKIN: Irritation may result from prolonged skin contact.

EYES: Contact with dust or mist may cause eye irritation.

INHALATION: Dust inhalation may irritate nose, throat and lungs.

INGESTION: Not generally considered toxic. If swallowed, irritation may develop in the mouth, esophagus, stomach, etc. The sulfate ion may cause purging

DELAYED EFFECTS: None known.

SULF-N™ Ammonium Sulfate

Ingredients found on one of the OSHA designated carcinogen lists are listed below.

INGREDIENT NAME	NTP STATUS	IARC STATUS	OSHA LIST
No ingredients listed in this section			

4. FIRST AID MEASURES

SKIN: Wash promptly with soap and water and flush with water until chemical is removed. Remove any contaminated clothing and wash before reuse. Get medical attention for irritation.

EYES: Flush promptly with plenty of water for at least 15 minutes. Get medical attention.

INHALATION: Remove to fresh air. If breathing is difficult, give oxygen if a qualified operator is available. Get medical attention for irritation or discomfort.

INGESTION: If conscious, drink 2 to 4 glasses of water and induce vomiting by touching back of throat with finger.

ADVICE TO PHYSICIAN: No specific advice. Treat according to symptoms present.

5. FIRE FIGHTING MEASURES

FLAMMABLE PROPERTIES

FLASH POINT: Not applicable.
FLASH POINT METHOD: Not applicable.
AUTOIGNITION TEMPERATURE: Not applicable.
UPPER FLAME LIMIT (Volume % in air): Not applicable.
LOWER FLAME LIMIT (Volume % in air): Not applicable.
FLAME PROPAGATION RATE (solids): Not applicable.
OSHA FLAMMABILITY CLASS: Not flammable.

EXTINGUISHING MEDIA:
Any standard agent may be used. If involved in a fire, flood with water.

UNUSUAL FIRE AND EXPLOSION HAZARDS:
Decomposes at elevated temperatures to produce toxic fumes of ammonia and sulfur oxides. If mixed with strong oxidizers such as ammonium nitrate or potassium salts (nitrite, nitrate or chlorate), a vigorous reaction or explosion may occur.

SPECIAL FIRE FIGHTING PRECAUTIONS/INSTRUCTIONS:
Since toxic gases may be released violently at high temperatures, firefighters should wear full protective clothing and NIOSH-approved, self-contained breathing apparatus. Use water to keep fire-exposed containers cool.

6. ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL OR OTHER RELEASE: (Always wear recommended personal protective equipment.) Shovel up large spills (dry chemical) for use or disposal. Sweep up small spills and maximize recovery. Flush residue with water if permitted by applicable disposal regulations.

Spills and releases may have to be reported to Federal and/or local authorities. See Section 15 regarding reporting requirements.

7. HANDLING AND STORAGE

NORMAL HANDLING: (Always wear recommended personal protective equipment.)
Avoid contact with eyes, skin and clothing. Avoid breathing dust. Keep containers closed and avoid rough handling. Follow good personal hygiene and housekeeping practices.

STORAGE RECOMMENDATIONS: Store in a cool, dry place away from strong oxidizers, such as chlorates, nitrates and nitrites.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING CONTROLS: Provide local exhaust, if dusty conditions prevail.

PERSONAL PROTECTIVE EQUIPMENT

SKIN PROTECTION: To minimize skin contact, wear long-sleeve shirt, trousers and gloves for routine product handling and use.

EYE PROTECTION: Under dusty or misty conditions, wear chemical safety goggles. Do not wear contact lenses.

RESPIRATORY PROTECTION: Where dusty or misty conditions require it, use a NIOSH-approved dust or mist respirator for needed protection.

ADDITIONAL RECOMMENDATIONS: None generally required.

EXPOSURE GUIDELINES

INGREDIENT NAME	ACGIH TLV	OSHA PEL	OTHER LIMIT
Ammonium Sulfate	Nuisance Dust: mg/m^3 TLV – total	Nuisance Dust: 15 Mg/m^3 TLV - Respirable	None

Other exposure limits for potential decomposition products nominally associated with product use: None.

9. PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Colorless to dark brown crystals or granules.
PHYSICAL STATE: Solid
MOLECULAR WEIGHT: 132.14
CHEMICAL FORMULA: $(NH_4)_2SO_4$
ODOR: Odorless
SPECIFIC GRAVITY: (Water = 1.0) 1.77
SOLUBILITY IN WATER: (Weight %) 38% solution @ 20°C
pH: 5.5 (1.3% solution)
BOILING POINT: Not applicable.
MELTING POINT: Not applicable.
VAPOR PRESSURE: Not applicable.
VAPOR DENSITY: (Air = 1.0) Not applicable.
EVAPORATION RATE: Not applicable.
% VOLATILES: Not applicable.
FLASH POINT: Not applicable.

(Flash point method and additional flammability data are found in Section 5.)

10. STABILITY AND REACTIVITY

NORMALLY STABLE (Conditions to avoid): Stable under normal conditions. Avoid temperatures above 280°C (536°F) - decomposes.

INCOMPATIBILITIES: Oxidizers; e.g., potassium salts - nitrite, nitrate, chlorate; also, chlorine and hypochlorite. Avoid contact with zinc-clad, copper and copper-bearing materials.

HAZARDOUS DECOMPOSITION PRODUCTS: Ammonia and sulfur trioxide and sulfur dioxide gases

HAZARDOUS POLYMERIZATION: Will not occur.

11. TOXICOLOGICAL INFORMATION

IMMEDIATE (ACUTE) EFFECTS:

LD_{50} (oral-rat): 3000 mg/kg
Skin irritation -A single dermal dose of 0.5 g elicited transient (reversible) mild dermal irritation in the rabbit.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS: Eye irritation -A single ocular dose of 100 mg elicited transient (reversible) moderate ocular irritation in the rabbit.
There was no evidence of skin sensitization seen in guinea pigs.

OTHER DATA: None.

12. ECOLOGICAL INFORMATION

Degradability - Not applicable.
Aquatic toxicity: Daphnia magna: 25 hr. TLm: 423 mg/l
50 hr. TLm: 433 mg/l
100 hr. TLm: 292 mg/l
Seedling Emergence -There were no treatment related signs of phytotoxicity and no adverse effects on seedlings noted.

13. DISPOSAL CONSIDERATIONS

RCRA: Is the unused product a RCRA hazardous waste if discarded? No.
If yes, the RCRA ID number is: Not applicable.

OTHER DISPOSAL CONSIDERATIONS: One use of ammonium sulfate is as a fertilizer; therefore, waste ammonium sulfate might be used as a fertilizer. If discarded to waterways, it may promote eutrophication. Disposal must be in accordance with applicable disposal regulations. Users should consult with appropriate regulatory agencies before discharging or disposing of waste material.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not regulated.
US DOT ID NUMBER: Not applicable.

For additional information on shipping regulations affecting this material, contact the information number found on the first page.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Material is on the TSCA Inventory.

DELAYED (SUBCHRONIC AND CHRONIC) EFFECTS: Eye irritation -A single ocular dose of 100 mg elicited transient (reversible) moderate ocular irritation in the rabbit.
There was no evidence of skin sensitization seen in guinea pigs.

OTHER DATA: None.

12. ECOLOGICAL INFORMATION

Degradability - Not applicable.
Aquatic toxicity: Daphnia magna: 25 hr. TLm: 423 mg/l
50 hr. TLm: 433 mg/l
100 hr. TLm: 292 mg/l
Seedling Emergence -There were no treatment related signs of phytotoxicity and no adverse effects on seedlings noted.

13. DISPOSAL CONSIDERATIONS

RCRA: Is the unused product a RCRA hazardous waste if discarded? No.
If yes, the RCRA ID number is: Not applicable.

OTHER DISPOSAL CONSIDERATIONS: One use of ammonium sulfate is as a fertilizer; therefore, waste ammonium sulfate might be used as a fertilizer. If discarded to waterways, it may promote eutrophication. Disposal must be in accordance with applicable disposal regulations. Users should consult with appropriate regulatory agencies before discharging or disposing of waste material.

The information offered here is for the product as shipped. Use and/or alterations to the product such as mixing with other materials may significantly change the characteristics of the material and alter the RCRA classification and the proper disposal method.

14. TRANSPORT INFORMATION

US DOT HAZARD CLASS: Not regulated.
US DOT ID NUMBER: Not applicable.

For additional information on shipping regulations affecting this material, contact the information number found on the first page.

15. REGULATORY INFORMATION

TOXIC SUBSTANCES CONTROL ACT (TSCA)

TSCA INVENTORY STATUS: Material is on the TSCA Inventory.

SULF-N™ Ammonium Sulfate

OTHER TSCA ISSUES: None.

SARA TITLE III/CERCLA

RQs & TPQs:

"Reportable Quantities" (RQs) and/or "Threshold Planning Quantities" (TPQs) exist for the following ingredients.

INGREDIENT NAME	SARA/CERCLA RQ (lbs.)	SARA EHS TPQ (lbs.)

No ingredients listed in this section

Spills or releases resulting in the loss of any ingredient at or above its RQ requires immediate notification to the National Response Center [(800) 424-8802] and to your Local Emergency Planning Committee.

SECTION 311 HAZARD CLASS: Immediate.

SARA 313 TOXIC CHEMICALS:

The following ingredients are SARA 313 "Toxic Chemicals". CAS numbers and weight percents are found in Section 2.

INGREDIENT NAME	COMMENT

No ingredients listed in this section.

STATE RIGHT-TO-KNOW

In addition to the ingredients found in Section 2, the following are listed for state right-to-know purposes.

INGREDIENT NAME	WEIGHT %	COMMENT

No ingredients listed in this section.

ADDITIONAL REGULATORY INFORMATION: None.

SULF-N™ Ammonium Sulfate

WHMIS CLASSIFICATION (CANADA): Not determined.

FOREIGN INVENTORY STATUS: Not determined.

16. OTHER INFORMATION

CURRENT ISSUE DATE:	December 2002
PREVIOUS ISSUE DATE:	May 2000

CHANGES TO MSDS FROM PREVIOUS ISSUE DATE ARE DUE TO THE FOLLOWING:

1. Corporate name changed to Honeywell.
2. Information and emergency telephone numbers changed.
3. Use TM and remove "45" from the tradename.

OTHER INFORMATION: None

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Muriate of Potash Coarse **M13060**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Muriate of Potash Coarse
Common Name: 0-0-60
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
			Hazardous		
None listed					
			Non-Hazardous		
Potassium Chloride	7447-40-7	KCl	94	10 mg/M^3 - Nuisance Dust	None listed
Inert Minerals			6		

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled:
Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

Trade Name: Muriate of Potash Coarse **M13060**
Registration No: None

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

g Point: Not applicable
ensity: 85-91 lbs/ft^3
Flashpoint: Non-flammable
pH: Not listed
Appearance: Colorless or white crystals, granules or powder.
Extinguishing Media: Use media suitable to extinguish source of fire.
Solubility in Water: 11 gm/100 ml H_2O @ 68°F
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: Extremely high temperatures.
Incompatibility (Material to Avoid): Strong oxidizing agents. Prolonged contact may cause oxidation of unprotected metals.
Hazardous Decomposition Products: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x, CN, or chlorine gas.
Hazardous Polymerization: Will not occur

SECTION 11 TOXICOLOGY INFORMATION

Acute Oral Toxicity: LD_{50} (rat) is 1,500 - 2,600 mg/kg (ppm); not acutely toxic by oral exposure for potassium chloride. (TFI Product Testing Results, OECD Guideline 425)
Acute Aquatic Toxicity: Fish 96-hour LC_{50} is 2,010 mg/L for potassium chloride.

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Pick up with a shovel and broom and use as a fertilizer by applying to soil using good agricultural and soil management.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by DOT
d Class: None
rtable Quantity (RQ): None
abels Required: None
Placard: None
C.A.S. Number: 7447-40-7
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity: by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable
Flammable Limits (% BY VOLUME) LOWER N/A UPPER N/A

MSDS Version Number: 4 (revisions to Section 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 238-2700

Agrium Material Safety Data Sheet

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	PROTECTIVE CLOTHING
			

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME **Ultra Yield Iron Oxy-Sulfate 40%**

SYNONYM	Iron oxide sulfate	**MSDS NUMBER:**	14170
CHEMICAL NAME	iron hydroxide sulfate	**REVISION NUMBER**	4.5
CHEMICAL FAMILY	Metal salt.	**MSDS prepared by the Environment, Health and Safety Department on:**	March 5, 2001
CHEMICAL FORMULA	$Fe_4H_2O_{22}S_5$	**24 HR EMERGENCY TELEPHONE NUMBER:**	Transportation: 1-800-792-8311 Medical: 1-888-670-8123
MATERIAL USES	Agricultural use: Fertilizer ingredient.		

MANUFACTURER

Various

SUPPLIER

Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.
Suite 1700, 4582 South Ulster St.
Denver, Colorado, U.S.A., 80237

Section II. Hazardous Ingredients

		Exposure Limits (ACGIH)						
NAME	**CAS #**	**TLV-TWA mg/m³**	**TLV-TWA ppm**	**STEL mg/m³**	**STEL ppm**	**CEIL mg/m³**	**CEIL ppm**	**% by Weight**
No regulated components.								

TOXICOLOGICAL DATA ON INGREDIENTS Ferrous sulfate:
LD50: 319 mg/kg Rat Oral

Section III. Hazards Identification

POTENTIAL ACUTE HEALTH EFFECTS

Low order of toxicity on ingestion. May cause eye and skin irritation. Over-exposure may result in nausea and gasto-intestinal irritation. Over-exposure by inhalation may cause respiratory tract irritation.

POTENTIAL CHRONIC HEALTH EFFECTS

CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA. MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA. TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA. There is no known effect from chronic exposure to this product.

Continued on Next Page

Section IV. First Aid Measures

EYE CONTACT	May cause eye irritation. Check for and remove any contact lenses. Immediately flush eyes with running water for at least 15 minutes, keeping eyelids open. Obtain medical attention if irritation persists.
MINOR SKIN CONTACT	May cause skin irritation due to the drying action of mineral salts. Wash contaminated skin with soap and water. Cover irritated skin with an emollient. If irritation persists, obtain medical attention. Wash contaminated clothing before reusing.
EXTENSIVE SKIN CONTACT	No additional information.
MINOR INHALATION	Repeated or prolonged inhalation of dust may lead to respiratory irritation. Loosen tight clothing around the individual's neck and waist. Allow the person to rest in a well ventilated area. Obtain medical attention if irritation persists.
SEVERE INHALATION	In emergency situations use proper respiratory protection to evacuate affected individuals to a safe area as soon as possible. Loosen tight clothing around the person's neck and waist. Oxygen may be administered if breathing is difficult. If the person is not breathing, perform artificial respiration. Obtain immediate medical attention.
SLIGHT INGESTION	Remove dentures if any. If conscious, have person drink several glasses of water or milk and induce vomiting. Never give anything by mouth to an unconscious person. Lower the head so that the vomit will not reenter the mouth and throat. Obtain medical attention.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

THE PRODUCT IS	Non-flammable.
AUTO-IGNITION TEMPERATURE	Not applicable.
FLASH POINT	Not applicable.
FLAMMABILITY LIMITS	Not applicable.
PRODUCTS OF COMBUSTION	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release sulfur oxides.
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	This product is non-explosive.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Material will not burn. Undergoes thermal decomposition at elevated temperatures to release toxic gases. Use extinguishing media suitable for surrounding materials.
SPECIAL REMARKS ON FIRE HAZARDS	Non combustible. Flammable/toxic gases will form at elevated temperatures (>300 °C) by thermal decomposition (sulfur oxides). A self contained breathing apparatus should be used to avoid inhalation of toxic fumes.
SPECIAL REMARKS ON EXPLOSION HAZARDS	No additional remark.

Continued on Next Page

Section VI. Accidental Release Measures

SMALL SPILL	Use appropriate tools to put the spilled solid in a suitable container for intended use or disposal.
LARGE SPILL	Prevent additional discharge of material, if possible to do so without hazard. Prevent spills from entering sewers, watercourses, wells, etc. Product may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250 mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable. Recover and place material in suitable containers for recycle, reuse, or disposal. Ensure disposal complies with government requirements and local regulations.

Section VII. Handling and Storage

PRECAUTIONS	Avoid contact with skin and eyes. After handling, always wash hands thoroughly with soap and water. Do not breathe dust. Keep away from food, drink and animal feed. Avoid contact with incompatible substances. Keep out of reach of children.
STORAGE	Store in a dry, cool and well ventilated area.

Section VIII. Exposure Controls/Personal Protection

ENGINEERING CONTROLS	Use process enclosures, local exhaust ventilation, or other engineering controls to keep airborne levels below recommended exposure limits. If user operations generate dust, use ventilation to keep exposure to airborne contaminants below the exposure limit.
PERSONAL PROTECTION	The selection of personal protective equipment varies, depending upon conditions of use. Wear appropriate respiratory protection for dust/mist when ventilation is inadequate. A filtering facepiece dust mask is recommended for most applications if respiratory protection is needed. Where skin and eye contact may occur as a result of brief periodic exposures, wear long sleeved clothing, coveralls, chemical resistant gloves, and safety glasses with side shields. A NIOSH/MSHA approved dust and mist respirator may be used under conditions where airborne concentrations may exceed occupational exposure limits. Protection provided by air purifying respirators may be limited. A positive pressure supplied air respirator should be used if concentrations are unknown or under any other other circumstances where air purifying respirators may be inadequate. A respiratory protection program that meets OSHA 29 CFR 1910.134 requirements must be followed whenever workplace conditions warrant a respirator's use.
PERSONAL PROTECTION IN CASE OF LARGE RELEASE	No additional information.
EXPOSURE LIMITS	TLV-TWA 1.0 mg/m^3 as soluble iron salts Ref: ACGIH. Federal, State, and Provincial exposure limits may vary. Consult local officials for acceptable exposure limits in your jurisdiction.

Section IX. Physical and Chemical Properties

PHYSICAL STATE AND APPEARANCE	Granular solid.		
MOLECULAR WEIGHT	Not available.	**COLOR**	Dark brown or grey.
pH (10% SOLN/WATER)	5.0 - 6.0	**ODOR**	Odorless.
BOILING POINT	Decomposes.	**ODOR THRESHOLD**	17 PPM (Ammonia)
MELTING POINT	Not available.	**TASTE**	Acrid. (Slight.)
CRITICAL TEMPERATURE	Not available.	**VOLATILITY**	Not applicable.
SPECIFIC GRAVITY g/cc	Not available.	**SOLUBILITY**	Easily soluble in hot water. Soluble in cold water.
BULK DENSITY kg/m^3 : lbs/ft^3	1680 kg/m^3; 105 lbs/ft^3	**DISPERSION PROPERTIES**	See solubility in water.
VAPOR PRESSURE	Not applicable.	**WATER/OIL DIST. COEFF.**	Not available.
VAPOR DENSITY	Not applicable.		

Continued on Next Page

Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional remark.
INCOMPATABILITY WITH VARIOUS SUBSTANCES	Slightly reactive to reactive with oxidizing agents. Very slightly to slightly reactive with metals, alkalis, moisture.
CORROSIVITY	Highly corrosive in presence of aluminum, zinc, and copper. Slightly corrosive to steel, and 304 stainless steel. Non-corrosive to 316 stainless steel.
SPECIAL REMARKS ON REACTIVITY	Avoid contact with moisture. Slow hydrolysis will produce corrosive acids.
SPECIAL REMARKS ON CORROSIVITY	Incompatible with copper alloys. Corrosive to brass. Corrosive to ferrous metals and alloys. Contact your sales representative or a metallurgical specialist to ensure compatability with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion. Inhalation.
TOXICITY TO ANIMALS	Dust irritating to respiratory tract. Harmful if inhaled or swallowed. Ingestion of this substance may produce irritation of the gastro-intestinal tract, characterized by burning and diarrhea.
SPECIAL REMARKS ON TOXICITY TO ANIMALS	May be harmful to fish, livestock, and wildlife. Dissolved mineral salts may cause irritation of the digestive tract.
OTHER EFFECTS ON HUMANS	Our data base contains no additional remark on the toxicity of this product
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional remark.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional remark.

Section XII. Ecological Information

ECOTOXICITY	Non-persistent. Non-cumulative when applied using normal agricultural practises. Low toxicity for humans or animals under normal conditions of use. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal exposure. Aquatic/Marine Toxicity: Will release ammonium ions. Ammonia is a toxic hazard to fish. Avoid spills or release to watercourses. Will disperse with current. Release to watercourses may cause effects down stream from the point of release. U.S. D.O.T.: This material NOT listed as a Marine pollutant.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Sulfur oxides (SO2, SO3 ...)
TOXICITY OF THE PRODUCTS OF DEGRADATION	The products of biodegradation are not harmful under normal conditions of slow metabolic release.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Product may degrade water quality and taste. Notify downstream water users. Sulfate in potable drinking water should be maintained below 250mg/L. Will dissolve and disperse in water. Reclaiming material may not be viable.

Continued on Next Page

Section XIII. Disposal Considerations

WASTE DISPOSAL OR RECYCLING	Recover and place material in a suitable container for intended use or disposal. Ensure disposal complies with government requirements and local regulations.

Section XIV. Transport Information

DOT / TDG CLASSIFICATION	Not controlled under TDG (Canada) or D.O.T. (U.S.A.)
PIN	Not applicable (PIN and PG).
SPECIAL PROVISIONS FOR TRANSPORT	Not applicable.
DOT (U.S.A) (Pictograms)	

Section XV. Other Regulatory Information and Pictograms

OTHER REGULATIONS

CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and is acceptable for use under the provisions of CEPA.

Federal Drinking Water Guidelines: EPA 300 ug/l, Iron
State Drinking Water Standards:
ILLINOIS 1000 ug/l, Iron; NORTH CAROLINA 300 ug/l, Iron; MAINE 340 ug/l, Iron; MARYLAND 300 ug/l; Iron
Clean Water Act Requirements:
Designated as a hazardous substance under section 311(b)(2)(A) of the Federal Water Pollution Control Act and further regulated by the Clean Water Act Amendments of 1977 and 1978. These regulations apply to discharges of this substance.
CERCLA Reportable Quantities:
Persons in charge of vessels or facilities are required to notify the National Response Center (NRC) immediately, when there is a release of this designated hazardous substance, in an amount equal to or greater than its reportable quantity of 1000 lb or 454 kg. The toll free number of the NRC is (800) 424-8802. The rule for determining when notification is required is stated in 40 CFR 302.4 (section IV. D.3.b).

FDA Requirements:
Bottled water shall, when a composite of analytical units of equal volume from a sample is examined by the methods described in paragraph (d)(1)(ii) of this section, meet the standards of chemical quality and shall not contain sulfate in excess of 250 mg/l and shall not contain iron in excess of 0.3 mg/l. Iron used as a dietary supplement in food for human consumption is generally recognized as safe when used in accordance with good manufacturing practice. Iron used as a nutrient and/or dietary supplement in animal drugs, feeds, and related products is generally recognized as safe when used in accordance with good manufacturing or feeding practice.

OTHER CLASSIFICATIONS	**HCS (U.S.A.)**	Not controlled under the HCS (United States).
	DSCL (EEC)	Not controlled under DSCL (Europe).

National Fire Protection Association (U.S.A.)

Hazards presented under acute emergency conditions only:

TDG (Pictograms - Canada)

Continued on Next Page

DSCL (Europe) (Pictograms)	
ADR (Europe) (Pictograms)	

Section XVI. Other Information

REFERENCES	-29 CFR Part 1910 -40 CFR Parts 1-799 -49 CFR Parts 1-199 -Canadian Centre for Occupational Health and Safety CCInfo Disk. -American Conference of Governmental Industrial Hygienists, Threshold Limit Values for Chemical Substances, 2000. -Corrosion Data Survey, Sixth Edition, 1985, National Association of Corrosion Engineers. -Fire Protection Guide to Hazardous Materials, (NFPA49, 325M, 491M, and 704), National Fire Protection Association, 10th Ed, 1991. -TOMES Plus®, Vol 43, January 2000, Micromedex Inc.
OTHER SPECIAL CONSIDERATIONS	CANADIAN ENVIRONMENTAL PROTECTION ACT (CEPA): This product is on the Domestic Substances List (DSL), and acceptable for use under the provisions of CEPA.
FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT	**AGRIUM** **Environment, Health and Safety Department** **Telephone (780) 998-6134 or Fax (780) 998-6143**

NOTICE TO READER

The buyer assumes all risk in connection with the use of this material. The buyer assumes all responsibility for ensuring this material is used in a safe manner in compliance with applicable environmental, health and safety laws, policies and guidelines. Agrium Inc. assumes no responsibility or liability for the information supplied on this sheet, including any damages or injury caused thereby. Agrium Inc. does not warrant the fitness of this material for any particular use and assumes no responsibility for injury or damage caused directly or indirectly by or related to the use of the material. The information contained in this sheet is developed from what Agrium Inc. believes to be accurate and reliable sources, and is based on the opinions and facts available on the date of preparation.

MATERIAL SAFETY DATA SHEET

K-Mag®, all grades

1. CHEMICAL PRODUCT AND COMPANY IDENTIFICATION

Product Name:	K-Mag®, all grades
Chemical Name:	Potassium Magnesium Sulfate
Chemical Family:	Inorganic Salt
Synonyms/Brands:	Potassium Magnesium Sulfate, SPM, Langbeinite Sulfate of Potash Magnesia Sul-Po-Mag®
Chemical Formula:	$K_2SO_4 . 2MgSO_4$
Primary Use:	Potash Crop Nutrient
Responsible Party:	IMC USA Inc. 100 South Saunders Road, Suite 300 Lake Forest, Illinois 60045
Non-Emergency Technical Contact:	8:00am – 4:00pm Central Time USA, Mon - Fri: 800-323-5523 or 847-739-1200

EMERGENCY OVERVIEW

24 Hour Emergency Telephone Number:

For Chemical Emergencies:

Spill, Leak, Fire or Accident

Call CHEMTREC

North America: 800-424-9300

Others: 703-527-3887 (collect)

Health Hazards:	Irritant. Avoid contact with eyes, skin and clothing. Wash thoroughly after handling.
Physical Hazards:	None known
Physical Form:	Solid
Appearance:	White to gray, crystalline or granular
Odor:	None

NFPA HAZARD CLASS		**HMIS HAZARD CLASS**	
Health:	1 (Slight)	Health:	1 (Slight)
Flammability:	0 (Least)	Flammability:	0 (Least)
Instability:	0 (Least)	Reactivity:	0 (Least)
Special Hazard:	None	PPE:	Section 8

2. COMPOSITION/INFORMATION ON INGREDIENTS

Component	% Weight	Exposure Guideline		
		Limits	Agency	Type
Potassium Magnesium Sulfate (Langbeinite) CAS No. 14977-37-8	88 - 99.5	NE	OSHA ACGIH	All
Sodium Chloride CAS No. 7647-14-5	0.5 – 12	NE	OSHA ACGIH	All

NE= Not established, but the following particulate limits apply to all inert inorganic dusts.

Particulates Not Otherwise Classified (PNOC)	10 mg/m^3 3 mg/m^3	ACGIH ACGIH	TWA-Inhalable TWA-Respirable
Particulates Not Otherwise Regulated (PNOR)	15 mg/m^3 5 mg/m^3	OSHA OSHA	TWA-Total Dust TWA-Respirable

Note: State, local or other agencies or advisory groups may have established more stringent limits. Consult an industrial hygienist or similar professional, or your local agencies, for further information.

3. HAZARDS IDENTIFICATION

POTENTIAL HEALTH EFFECTS	
Eye:	Contact may cause mild eye irritation including stinging, watering and redness.
Skin:	Contact may cause mild irritation including redness and a burning sensation. No harmful effects from skin absorption have been reported.
Inhalation (Breathing):	No information available. Studies by other exposure routes suggest a low degree of hazard by inhalation.
Ingestion (Swallowing):	Low to moderate degree of toxicity by ingestion.
Signs and Symptoms:	Effects of overexposure may include irritation of the nose, throat and digestive tract, nausea, vomiting, diarrhea, abdominal cramping, irregular heartbeats (arrhythmia), dehydration, and hypertension.
Cancer:	Inadequate data available to evaluate the cancer hazard of this material.
Target Organs:	No data available.
Developmental:	Inadequate data available for this material.
Other Comments:	To the best of our knowledge, the chemical and toxicological properties of potassium magnesium sulfate have not been thoroughly investigated.
Pre-Existing Medical Conditions:	Respiratory diseases (asthma-like disorders) and high blood pressure (hypertension).

4. FIRST AID MEASURES

Eye:	If irritation or redness develops, move victim away from exposure and into fresh air. Flush eyes with clean water for at least 15 minutes. If symptoms persist, seek medical attention.
Skin:	Remove contaminated shoes and clothing and cleanse affected area(s) thoroughly by washing with mild soap and water. If irritation or redness develops and persists, seek medical attention.
Inhalation (Breathing):	If respiratory symptoms develop, move victim away from source of exposure and into fresh air. If symptoms persist, seek medical attention. If victim is not breathing, clear airway and immediately begin artificial respiration. If breathing difficulties develop, oxygen should be administered by qualified personnel. Seek immediate medical attention.
Ingestion (Swallowing):	If swallowed, seek emergency medical attention. If victim is drowsy or unconscious and vomiting, place on left side with the head down and do not give anything by mouth. If victim is conscious and alert and ingestion occurred within the last hour, vomiting should be induced for ingestion of large amounts (more than 5 ounces or a little more than ½cup in an adult) preferably under direction from a physician or poison center. If possible, do not leave victim unattended and observe closely for adequacy of breathing.
Note to Physicians:	None known

5. FIRE FIGHTING MEASURES

Flammable Properties:	**K-Mag® is non-flammable** Flash Point—Not applicable OSHA Flammability Class—Not applicable LEL/UEL—Not applicable Autoignition Temperature—Not applicable
Unusual Fire & Explosion Hazards:	None known
Extinguishing Media:	Use extinguishing agent suitable for type of surrounding fire.
Fire Fighting Instructions:	Positive pressure, self-contained breathing apparatus is required for all fire fighting activities involving hazardous materials. Full structural fire fighting (bunker) gear is the minimum acceptable attire. The need for proximity, entry, flashover and/or special chemical protective clothing (see Section 8) needs to be determined for each incident by a competent fire fighting safety professional. Water used for fire suppression and cooling may become contaminated. Discharge to sewer system(s) or the environment may be restricted, requiring containment and proper disposal of water.

6. ACCIDENTAL RELEASE MEASURES

K-Mag® is a naturally-occurring crop nutrient and plant food; however, large spills can harm or kill vegetation.

- Stay upwind and away from spill (dust hazard).
- Wear appropriate protective equipment, including respiratory protection, as conditions warrant (see Section 8).
- Prevent spilled material from entering sewers, storm drains, other unauthorized treatment drainage systems, and natural waterways.
- Notify appropriate federal, state, and local agencies as may be required.
- Minimize dust generation.
- Sweep up and package appropriately for disposal.

7. HANDLING AND STORAGE

Handling:	The use of appropriate respiratory protection is advised when concentrations exceed any established exposure limits (see Sections 2 and 8). Wash thoroughly after handling. Wash contaminated clothing or shoes. Use good personal hygiene practices.
Storage:	Stable under normal storage conditions.

8. EXPOSURE CONTROLS/PERSONAL PROTECTION

Engineering Controls:	If current ventilation practices are not adequate to maintain airborne concentrations below the established exposure limits (see Section 2), additional ventilation or exhaust systems may be required.

Personal Protective Equipment (PPE)	
Respiratory:	A NIOSH approved air purifying respirator with a type 95 (R or P) particulate filter may be used under conditions where airborne concentrations are expected to exceed exposure limits (see Section 2). Protection provided by air purifying respirators is limited (see manufacturer's respirator selection guide). Use a positive pressure air supplied respirator if there is potential for uncontrolled release, exposure levels are not known, or any other circumstances where air purifying respirators may not provide adequate protection. A respiratory protection program that meets OSHA's 29 CFR 1910.134 and ANSI Z88.2 requirements must be followed if workplace conditions warrant a respirator.

Personal Protective Equipment (PPE)	
Skin:	The use of cloth or leather work gloves is advised to prevent skin contact, possible irritation and absorption (see glove manufacturer literature for information on permeability).
Eye/Face:	Approved eye protection to safeguard against potential eye contact, irritation, or injury is recommended.
Other PPE:	A source of clean water should be available in the work area for flushing eyes and skin. Impervious clothing should be worn as needed.

9. PHYSICAL AND CHEMICAL PROPERTIES

Note: Unless otherwise stated, values are determined at 20°C (68°F) and 760 mm Hg (1 atm).

Flash Point:	Not applicable
Flammable/ Explosive Limits (%):	LEL/UEL: Not applicable
Autoignition Temperature:	Not applicable
Appearance:	White to gray, crystalline to granular
Physical State:	Crystalline to granular solid
Odor:	None
Molecular Weight of Pure Material:	415 (for potassium magnesium sulfate)
pH:	7.04 in a 5% solution
Vapor Pressure (mm Hg):	Not applicable
Vapor Density (air=1):	Not applicable
Boiling Point:	Not available
Freezing/Melting Point:	972°C (1700°F)
Solubility in Water:	Approximately 24.4% @ 77°F (25°C)
Specific Gravity:	2.81 - 2.85
Volatility:	No data available
Bulk Density:	Loose – 83 to 94 lbs/ft^3 (1330 – 1505 kg/m^3)

10. STABILITY AND REACTIVITY

Chemical Stability:	Stable under normal conditions of storage and handling.
Conditions to Avoid:	Mildly corrosive to metals in the presence of moisture.
Incompatible Materials:	Avoid contact with hot nitric acid, may cause evolution of toxic nitrosyl chloride. Contact with other strong acids may produce irritating hydrogen chloride gas. NaCl reacts with most noble metals, such as iron or steel, building materials (such as cement), bromine, or trifluoride. A potentially explosive reaction may occur if NaCl is mixed with dichloromaleic anhydride and urea. Electrolysis of mixtures containing NaCl and nitrogen compounds may form explosive nitrogen trichloride.
Hazardous Decomposition Products:	Combustion can yield oxides of sulfur when heated above 1000°F (537°C).
Hazardous Polymerization:	Will not occur.

11. TOXICOLOGICAL INFORMATION

Potassium Magnesium Sulfate	No LD50 or LC50 data located for potassium magnesium sulfate. No eye or skin irritation data located for potassium magnesium sulfate.
Sodium Chloride	Rat, oral, LD50 = 3 g/kg; Mouse, oral, LD50 = 4 g/kg Rat, LC50 > 42 g/m^3 / 1hour Rabbit, Eye: 100 mg/24 hour, moderate irritant Rabbit, Eye: 500 mg/24 hour, mild irritant No skin irritation data located for sodium chloride
No definitive information available for this product on skin irritation, carcinogenicity, mutagenicity, target organs or developmental toxicity.	

12. ECOLOGICAL INFORMATION

Ecotoxicity:	When dissolved in water, sodium chloride creates an elevated level of salinity that may be harmful to fresh water aquatic species and to plants that are not salt-tolerant.
BOD and COD:	No data found.

13 DISPOSAL CONSIDERATIONS

This material, if discarded as produced, is not an RCRA "listed" or "characteristic" hazardous waste. Contamination may subject it to hazardous waste regulations. Properly characterize all waste materials. Consult state and local regulations regarding the proper disposal of this material.

14 TRANSPORT INFORMATION

Hazard Class or Division:	Not listed in the hazardous materials shipping regulations (49 CFR, Table 172.101) by the U.S. Department of Transportation, or in the Transport of Dangerous Goods (TDG) Regulations Canada.

15 REGULATORY INFORMATION

CERCLA:	Not Listed
RCRA 261.33:	Not Listed
SARA Title III: (Exemptions at 40 CFR, Part 370 may apply for agricultural use, or quantities of less than 10,000 pounds on-site)	**SARA 313:** No
	SARA 311/312: Acute: Yes; Chronic: No; Fire: No; Pressure: No; Reactivity: No
	SARA 302/304: No
TSCA:	Sodium Chloride is listed in the TSCA Inventory. Potassium Magnesium Sulfate (langbeinite) is a naturally-occurring chemical substance processed only by mechanical means that is exempted from TSCA listing per 40 CFR, Part 710.26(d).
Proposition 65: (CA Health & Safety Code Section 25249.5)	Warning: This product contains substances that are known to the State of California to cause cancer and/or reproductive harm.
NTP, IARC, OSHA:	None of the ingredients in this product has been identified as carcinogens by NTP, IARC, or OSHA.
Canada DSL:	Sodium chloride is listed on the Domestic Substances List (DSL). As potassium magnesium sulfate (langbeinite) is a naturally occurring substance processed only by mechanical means, it is considered to be on the DSL per the Canadian Environmental Protection Act (CEPA), New Substances Notification Regulations, Section 3.
Canada NDSL:	No
WHMIS:	This MSDS has been prepared according to the hazard criteria of the Controlled Product Regulations (CPR) and the MSDS contains all of the information required by the CPR.

16. OTHER INFORMATION

The information in this document is believed to be correct as of the date issued. **HOWEVER, NO WARRANTY OF MERCHANTABILITY, FITNESS FOR ANY PARTICULAR PURPOSE, OR ANY OTHER WARRANTY IS EXPRESSED OR IS TO BE IMPLIED REGARDING THE ACCURACY OR COMPLETENESS OF THIS INFORMATION, THE RESULTS TO BE OBTAINED FROM THE USE OF THIS INFORMATION OR THE PRODUCT, THE SAFETY OF THIS PRODUCT, OR THE HAZARDS RELATED TO ITS USE.** This information and product are furnished on the condition that the person receiving them shall make their own determination as to suitability of the product for their particular purpose and on the condition that they assume the risk of their use thereof.

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Gypsum (Phosphatic) **M16050**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Gypsum (Phosphatic)
Common Name: Gypsum, Calcium Sulfate Dihydrate
Chemical Type: Salt

SECTION 2 COMPOSITION/INFORMATION ON INGREDIENTS

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
			Hazardous		
None listed					
			Non-hazardous		
Gypsum	10101-41-4	$(CaSO_4.2H_2O)$	85	10 mg/M^3 - Nuisance Dust	15 mg/m^3 - total dust
Other non-hazardous ingredients			15	Not listed	Not listed

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Non-toxic.
Inhalation: May cause slight discomfort.
Eye Contact: May cause slight discomfort to eyes.
Skin Absorption: Not absorbed through the skin.
Skin Contact: May cause slight abrasion with prolonged contact.
Effects of Overdose: None listed.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount ingested, give 2-3 glasses of water and call a physician.
Inhalation: May cause discomfort to respiratory tract. Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with fresh running water to remove dust. Seek medical attention if condition persists.
Skin: Wash skin with mild soap and water. Seek medical attention if condition persists.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: None
Unusual Fire and Explosion Hazards: None

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Low toxicity to aquatic life. Keep out of waterways and bodies of water, do not contaminate any body of water by direct application, cleaning of equipment or disposal.
Steps to be taken in case material is released or spilled:
Sweep up and scoop into container for use, future use or disposal. May be used as a fertilizer following good agronomic practices.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Use normal good work procedures and good personal hygiene.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Natural ventilation.
Respiratory Protection: Wear a dust mask in a dusty environment.
Protective Clothing: Normal clean work clothing.
Eye Protection: Safety glasses with side shields or goggles in a dusty environment.
Other: Eyewash fountain.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not applicable (solid)
Density: Approx. 74 lbs/ft^3
Flashpoint: Non-flammable
pH: None listed
Appearance: White to dark gray powder or granules.
Extinguishing Media: Use media suitable to extinguish source of fire.

Solubility in Water: 0.3 g/100 g of H_2O @ 122°F
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

Trade Name: Gypsum (Phosphatic)
Registration No: None

M16050

SECTION 10 STABILITY AND REACTIVITY

...ility (Normal Conditions): Stable
Conditions to Avoid: None listed
Incompatibility (Material to Avoid): None listed
Hazardous Decomposition Products: SO_x gas when decomposing.
Hazardous Polymerization: Will not occur
Conditions to Avoid: Not applicable

SECTION 11 TOXICOLOGY INFORMATION

Inhalation: ihl-hmn TCLo: 194 gm/M^3/10Y-I:PUL.

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Consult local authorities.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by D.O.T.
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None
C.A.S. Number: 10101-41-4
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity:
by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

...n the 302 list of reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Not Applicable
Autoignition Temperature: Not Applicable
Flammable Limits (% BY VOLUME) LOWER N/A UPPER N/A

Hazard Rating (N.F.P.A.): **Health:** 0 **Fire:** 0 **Reactivity:** 0 **Specific:** Not Applicable
This N.F.P.A. rating is a recommendation by the manufacturer using the guidelines or published evaluations prepared by the National Fire Protection Association (N.F.P.A.).

MSDS Version Number: 3 (revisions to Section 15)

Reviewed by: The Department of Regulatory Affairs
July 1999 (208) 238-2700

Material Safety Data Sheet
J. R. Simplot Company
AgriBusiness

Trade Name: Sulfate of Potash Granular 0-0-50 **M13010**
Registration No: None

SECTION 1 CHEMICAL PRODUCT AND COMPANY INFORMATION

Manufacturer or Formulator: J.R. Simplot Company
P.O. Box 912
Pocatello, ID 83204
Emergency Phone - Chemtrec: 1-800-424-9300

Product Name: Sulfate of Potash Granular 0-0-50
Common Name: 0-0-50
Chemical Type: Inorganic Chemical Fertilizer

SECTION 2 COMPOSITION INFORMATION

Chemical Name and Synonyms	C.A.S. No.	Chemical Formula	WT%	TLV	PEL
None listed			**Hazardous**		
			Non-Hazardous		
Potassium Sulfate	7778-80-5	K_2SO_4	90	10 mg/M^3 - Nuisance Dust	Not available
Inert Materials	--	--	10		

SECTION 3 HAZARDS IDENTIFICATION

Ingestion: Minimal hazard under normal conditions and use. Ingestion of large quantities may cause gastrointestinal discomfort, vomiting, weakness or other medically related problems.
Inhalation: Dusty conditions may cause mechanical aggravation to respiratory mucous membranes.
Eye Contact: Dust from this product may cause particulate discomfort to eyes.
Skin Absorption: Not normally absorbed through the skin.
Skin Contact: Slight dermal abrasion is possible with prolonged contact, especially around cuffs and collars.
Effects of Overdose: Ingestion of large doses may cause diarrhea, nausea, abdominal cramps or formation of methemoglobinemia. Seek medical attention.

SECTION 4 FIRST AID MEASURES

Ingestion: If large amount is ingested, give 2-3 glasses of water and induce vomiting. Seek medical attention.
Inhalation: Remove to fresh air. Seek medical attention if condition persists.
Eyes: Flush eyes with running water for at least 15 minutes. Seek medical attention if condition persists.
Skin: Wash with soap and water. Seek medical attention if condition persists.
Notes to Physician: Consult standard literature. Treatment based on the sound judgment of the physician and the individual reactions of the patient.

SECTION 5 FIRE FIGHTING MEASURES

Extinguishing Media: Use media suitable to extinguish source of fire.
Special Fire Fighting Procedures: Product is not combustible.
Unusual Fire and Explosion Hazards: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Environmental Precautions: Keep out of water supplies, lakes, ponds, streams and rivers. This product is a fertilizer and may promote algae growth.
Steps to be taken in case material is released or spilled:
Keep from entering waterways. Sweep up material and place in suitable container for use as a fertilizer or for disposal.

SECTION 7 HANDLING AND STORAGE

Precautions to be taken in handling and storing:
Store in a cool, dry area. Prevent spillage and separate from strong oxidizers. Use normal safety procedures and good personal hygiene. Keep out of the reach of children.

SECTION 8 EXPOSURE CONTROLS/PERSONAL PROTECTION

Ventilation Protection: Adequate ventilation.
Respiratory Protection: Approved dust respirator when necessary.
Protective Clothing: Normal clean work clothing.
Eye Protection: In dusty conditions, safety glasses with side shields or goggles may be necessary.

Trade Name: Sulfate of Potash Granular 0-0-50 **M13010**
Registration No: None

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Boiling Point: Not applicable
Density: 85-91 lbs/ft^3
Flashpoint: Non-flammable
pH: Not listed
Appearance: Colorless or white, crystals, granules or powder.
Extinguishing Media: Use media suitable to extinguish source of fire.
Solubility in Water: 11 gm/100 ml H_2O @ 68°F
% Volatiles (by volume): Not applicable
Vapor Pressure, mm Hg: Not applicable
Reaction with Water: None

SECTION 10 STABILITY AND REACTIVITY

Stability (Normal Conditions): Stable
Conditions to Avoid: Extremely high temperatures.
Incompatibility (Material to Avoid): Strong oxidizing agents. Prolonged contact may cause oxidation of unprotected metals.
Hazardous Decomposition Products: During extremely high temperature fire conditions, the product may reach melting point and decompose to release NH_3, SO_x, PO_x or CN.
Hazardous Polymerization: Will not occur

SECTION 11 TOXICOLOGY INFORMATION

Acute Oral Toxicity: LD_{50} (rat) is greater than 6,600 mg/kg (ppm); not acutely toxic by oral exposure. (TFI Product Testing Results, OECD Guideline 425)
Acute Aquatic Toxicity: Fish 96-hour LC_{50}: 680-3,550 mg/L; daphnia 48-hour EC_{50}: 720-890 mg/L. Not toxic to aquatic organisms. (TFI Product Testing Results)

SECTION 12 ECOLOGICAL INFORMATION

None listed.

SECTION 13 DISPOSAL CONSIDERATIONS

Waste Disposal Procedures: Pick up with a shovel and broom and use as a fertilizer by applying to soil using good agricultural and soil management.

SECTION 14 TRANSPORT INFORMATION

Shipping name: Not regulated by DOT
Hazard Class: None
Reportable Quantity (RQ): None
Labels Required: None
Placard: None
C.A.S. Number: See "Ingredients"
D.O.T. Number: None
Haz Waste No: None
EPA Regist No: None

SECTION 15 REGULATORY INFORMATION

Carcinogenicity: by IARC?: Yes ( ) No (X) by NTP?: Yes ( ) No (X)

Not on the 302 list of SARA reportable quantities.

SECTION 16 OTHER INFORMATION

Flash Point (Test Method): Non-flammable
Autoignition Temperature: Not applicable

Flammable Limits (% BY VOLUME)	LOWER	UPPER
	N/A	N/A

MSDS Version Number: 5 (revisions toSection 11)

Reviewed by: The Department of Regulatory Affairs
June 2001 (208) 238-2700

Material Safety Data Sheet

Origin Zinc Sulfate 31%

Section 1 – PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: Origin Zinc Sulfate 31%
TRADE NAMES: None
SYNONYMS: Zinc Sulfate Monohydrate
CHEMICAL FAMILY: Inorganic Salt
MSDS CREATION DATE: June 2002
MSDS CURRENT REVISION DATE: None
DISTRIBUTED BY: Agriliance LLC, PO Box 64089, St. Paul, Minnesota 55164-0089, Phone 1-800-232-3639
EMERGENCY: CHEMTREC (24 Hour Emergency Response) 1-800-424-9300

Section 2 – COMPOSITION/INFORMATION ON INGREDIENTS

Ingredient Name	CAS Number	% wt
Zinc Sulfate Monohydrate	7446-19-7 7733-02-0 (anhydrous form)	~86
ANon-hazardous ingredients	-----	Balance

Section 3 – HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW: White free-flowing granules that may cause irritation to the skin and eyes (possibly severe). Product dusts may irritate respiratory tract. Harmful if swallowed. **NFPA Rating:** Health = 2, Fire = 0, Reactivity = 0

POTENTIAL HEALTH EFFECTS:

INHALATION: May cause irritation of the nasal membranes and upper respiratory tract, possibly severe. Significant exposures may result in difficulty breathing, low blood pressure, dizziness, bluish skin color and lung congestion.

SKIN CONTACT: May cause irritation, possibly severe.

EYE CONTACT: Contact may cause irritation, possibly severe. Additional effects may include tearing and/or blurred vision.

INGESTION: May irritate or cause burns to digestive tract. Significant exposures may cause effects such as fever, nausea, vomiting, diarrhea, stomach pain, blood in the stool, inability to urinate, low blood pressure, kidney damage, liver damage and convulsions.

LONG-TERM AND/OR DELAYED EFFECTS: Continued and prolonged overexposure may result in digestive disorders, kidney and/or liver damage.

CARCINOGEN STATUS:

OSHA: Not listed **NTP:** Not listed **IARC:** Not listed

Section 4 – FIRST AID MEASURES

INHALATION: Remove from exposure area to fresh air immediately. If breathing is difficult, oxygen may be administered by a qualified operator. Keep person warm and at rest. Get medical attention for irritation or any other symptom.

SKIN CONTACT: Remove contaminated clothing and shoes immediately. Wash affected area with soap or mild detergent and rinse with water until no evidence of product remains. Get medical assistance for irritation, burns or any other symptom.

EYE CONTACT: Flush eyes immediately with large amounts of water or normal saline solution, occasionally lifting upper and lower lids until no evidence of product remains (approximately 15-20 minutes). Cover with sterile bandages. Get medical attention immediately.

INGESTION: Dilute the product immediately with large amounts of water or milk. Do not induce vomiting unless directed to do so by a doctor or other medical professional. If vomiting occurs, keep head lower than hips to prevent introduction of fluid into the lungs. Get medical attention immediately.

NOTE TO PHYSICIAN: The decision as to whether the severity of poisoning requires administration of any antidote and actual dose required should be made by qualified medical personnel. The antidote for poisoning from zinc salts is calcium disodium edetate (oral or IV). Dreisbach, Handbook of Poisoning, 12th Edition.

Section 5 – FIRE-FIGHTING MEASURES

FLASH POINT: None
AUTOIGNITION TEMPERATURE: Not determined
FIRE AND EXPLOSION HAZARD: Product burns only with great difficulty but will decompose in the heat of a fire. Containers involved in a fire may rupture (possibly explosively) releasing decomposition products.
EXTINGUISHING MEDIA: Use any standard agent suitable for surrounding structural fire or for other chemicals that may be involved.
FIREFIGHTING: Wear appropriate self-contained positive pressure breathing apparatus. Move product from fire area if you can without risk. Avoid breathing vapors; keep upwind. Dike area to prevent runoff and contamination of water sources.
HAZARDOUS COMBUSTION PRODUCTS: Thermal decomposition may include toxic and hazardous oxides of zinc and sulfur.

Section 6 – ACCIDENTAL RELEASE MEASURES

IN CASE OF SPILL: Pick-up dry spills by scooping, shoveling or vacuuming and place into containers for reuse or disposal. Wear respirator, protective clothing and gloves. Keep unnecessary people away. Isolate hazard area and deny entry to avoid material dispersal. Do not allow product and/or runoff to enter sewers or waterways.

Section 7 – HANDLING AND STORAGE

STORAGE: Store in a cool, dry place. Protect from exposure to fire.
NORMAL HANDLING: Avoid contact with skin and eyes. Do not breath product dusts. Wash thoroughly after handling.

Section 8 – EXPOSURE CONTROLS/PERSONAL PROTECTION

EXPOSURE LIMITS

INGREDIENT	OSHA PEL	ACGIH TLV	Other values
No ingredients listed in this section	—	—	—

* = ACGIH Biological Exposure Value ** = AIHA Workplace Environmental Exposure Level

VENTILATION: Use of local exhaust is recommended at product transfer points and where dusty conditions exist.
EYE PROTECTION: Wear safety glasses. Use of splash shields or safety goggles is recommended for handling product solutions or for very dusty conditions.
CLOTHING: Wear trousers and long sleeved shirt to avoid skin contact. Clean work clothing before taking them home (preferred) or launder separately from household laundry.
GLOVES: Wear cotton or canvas protective gloves to prevent contact with this product. Use rubber gloves if it is likely material may become moist or wet.
RESPIRATOR: For normal product handling, use any NIOSH approved air-purifying dust respirator. For extremely dusty conditions, the use of a full-face air purifying particulate respirator is recommended.
EMERGENCY WASH FACILITIES: Where there is the potential that an employee's eyes and/or skin may be exposed to this product, the employer should provide an eye wash fountain and safety shower or another source of running water within the immediate work area.

Section 9 – PHYSICAL AND CHEMICAL PROPERTIES

DESCRIPTION: White, free-flowing granules
MOLECULAR FORMULA: ZnSO4 (zinc ingredient-anhydrous form)
MOLECULAR WEIGHT: 179.46 (zinc sulfate monohydrate) 161.44 (anhydrous form of zinc sulfate)
pH: 5.0 @ 10% solution
MELTING POINT: Decomposes above 500°C (932°F)
BOILING POINT: Not applicable
VAPOR PRESSURE: Not applicable
VAPOR DENSITY: Not applicable
WATER SOLUBILITY: 50% by weight
SOLVENT SOLUBILITY: Insoluble in alcohol
SPECIFIC GRAVITY: 3.28

Section 10 – STABILITY AND REACTIVITY

REACTIVITY: Stable under normal temperatures and pressures.
CONDITIONS TO AVOID: Avoid contact with strong oxidizers and/or excessive heat. Do not allow spilled material to contaminate water sources.
INCOMPATIBILITIES: Contact with strong oxidizers may result in a fire and explosion hazard.
HAZARDOUS DECOMPOSITION: Thermal decomposition products may include toxic and hazardous oxides of zinc and sulfur.
POLYMERIZATION: Has not been reported to occur under normal temperatures and pressures but may occur in fire conditions.

Section 11 – TOXICOLOGOICAL INFORMATION

Toxicological information listed below is for Zinc Sulfate (anhydrous).

ACUTE TOXICITY:
LD50: 1710 mg/kg, oral, rat
LD50: 245mg/kg, oral, mouse
LOCAL EFFECTS: Solutions may be corrosive-inhalation, skin, eye, ingestion
EYES; dose-420 ug; reaction: moderate (rabbit)
INHALATION: Inhalation of dust may cause irritation of the respiratory tract with sore throat, coughing, shortness of breath, labored breathing, pain in the nose, mouth, and throat, and burns of the mucous membranes. If sufficient quantities are inhaled, pulmonary edema may develop, often with a latent period of 5 - 72 hours. The symptoms may include tightness in the chest, dyspnea, frothy sputum, cyanosis, and dizziness. Physical findings may include weak, rapid pulse, hypotension, hemoconcentration, and moist rales.
INGESTION: Ingestion may cause a burning pain in the mouth and throat, fever, nausea, violent vomiting with severe abdominal pain, watery or bloody diarrhea, prostration, tenemus, retching, hyperglycemia, anuria, liver damage, kidney damage with albuminuria, acetonuria, and glycosuria, hypotension, sudden collapse, and convulsions
DELAYED/CHRONIC:
CARCINOGEN STATUS: Data not available. Some mutagenic screens have been run with mixed results.
CHRONIC EXPOSURE: Depending on the concentration and duration of exposure, repeated or prolonged exposure may cause inflammatory and ulcerative changes in the mouth and possibly bronchial and gastrointestinal disturbances. Prolonged ingestion of 33,000 mg/kg in drinking water resulted in severe anemia in mice

Section 12 – ECOLOGICAL INFORMATION

ACUTE AQUATIC TOXICITY:
LC_{50} rainbow trout 4.76 MG/L/48 HR, hard water /continuous flow conditions
LC_{50} rainbow trout 4.6 ppm/96 hr/fresh water /conditions of bioassay not specified/
DEGRADABILITY: No data available
LOG BIOCONCENTRATION FACTOR (BCF): No data available
LOG OCTANOL/WATER PARTITION COEFFICIENT: No data available

Section 13 – DISPOSAL CONSIDERATIONS

Product (as shipped) is not a RCRA hazardous waste if discarded. Observe all federal, state and local regulations when disposing of this product.

Section 14 - TRANSPORT INFORMATION

This product is not regulated in surface transportation in non-bulk quantities. The information below is for shipments exceeding 1,000 pounds in a single package, container, truck, or railcar.

US DOT SHIPPING NAME: Environmentally hazardous substances, solid, n.o.s. (Zinc Sulfate), 9, UN 3077, PG III, RQ
US DOT HAZARD CLASS: 9 – Miscellaneous hazardous material.
US DOT IDENTIFICATION NUMBER: UN 3077
US DOT PACKING GROUP: III
US DOT LABEL CODE: 9
REPOTABLE QUANTITY: 1,000 lbs (454 kg)

Section 15 – REGULATORY INFORMATION

TSCA STATUS: All ingredients are listed on the TSCA Inventory of Chemical Substances.
OTHER TSCA ISSUES: None
SARA 311 CLASSIFICATION: Acute hazard.
SARA 313 NOTIFICATION: There are no ingredients on the SARA 313 reporting list.
CERCLA RQs and TPQs: Zinc sulfate has a reportable quantity (RQ) of 1,000 lbs.
CALIFORNIA PROPOSITION 65: No ingredients found on the Propositions 65 list.

CANADIAN INVENTORY: All ingredients are listed on the Canadian Domestic Substances List.
WHMIS: This product has been classified in accordance with hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. Classification: D2B

Section 16 – ADDITIONAL INFORMATION

CHANGES FROM PREVIOUS VERSION: New MSDS

Individuals handling this product should be informed of the recommended safety precautions and should have access to this information. Customers are responsible for compliance with local, state and federal regulations that may be pertinent in the storage, application and disposal of this product.

Agrium Material Safety Data Sheet

NFPA Classification	DOT / TDG Pictograms	WHMIS Classification	PROTECTIVE CLOTHING
			

Section I. Chemical Product and Company Identification

PRODUCT NAME/ TRADE NAME **Ultra Yield Manganese Sulfate 27%**

SYNONYM	Manganese sulfate, Manganous sulfate	**MSDS NUMBER:**	14175
CHEMICAL NAME	Manganese sulfate	**REVISION NUMBER**	4.5
CHEMICAL FAMILY	An inorganic metal salt.	**MSDS prepared by the Environment, Health and Safety Department on:**	March 5, 2001
CHEMICAL FORMULA	$MnSO_4$	**24 HR EMERGENCY TELEPHONE NUMBER:**	
MATERIAL USES	Agricultural use: Fertilizer ingredient.	**Transportation Emergency: 1 (800) 792-8311** **Medical Emergency: 1 (888) 670-8123**	

MANUFACTURER

Various

SUPPLIER

Agrium
North American Wholesale
13131 Lake Fraser Drive, S.E.
Calgary, Alberta, Canada, T2J 7E8

Agrium U.S. Inc.
Suite 1700, 4582 South Ulster St.
Denver, Colorado, U.S.A., 80237

Section II. Hazardous Ingredients

		Exposure Limits (ACGIH)						
NAME	**CAS #**	**TLV-TWA mg/m³**	**TLV-TWA ppm**	**STEL mg/m³**	**STEL ppm**	**CEIL mg/m³**	**CEIL ppm**	**% by Weight**
Manganese sulfate	7785-87-7	0.2						27% as Mn

TOXICOLOGICAL DATA ON INGREDIENTS **Ultra Yield Manganese Sulfate 27%:**
ORAL (LD50): Acute: 2330 mg/kg [Mouse] as manganese sulfate

Section III. Hazards Identification

POTENTIAL ACUTE HEALTH EFFECTS

Acute systemic intoxication rarely occurs as it is poorly absorbed from the lungs or the gut. Systemic poisoning may result from chronic inhalation or chronic ingestion; chronic exposure to low concentrations may lead to the accumulation of toxic concentrations in critical organs. May cause eye and skin irritation.

POTENTIAL CHRONIC HEALTH EFFECTS

The usual form of chronic manganese poisoning primarily involves the CNS. The brain appears to sustain permanent cellular damage at exposure levels which do not otherwise affect a person. The characteristic pathological lesion in man is destruction of the ganglion cells of the basal ganglia, although symptoms appear before damage becomes discernible. Onset of chronic poisoning is insidious. Early symptoms include languor, sleepiness, tremors and weakness in legs. A stolid mask like appearance of face, slurred speech, emotional disturbances such as anorexia, apathy, and inability to concentrate, uncontrollable laughter, and loss of balance with a spastic gait and a tendency to fall while walking are findings in more advanced cases.

Continued on Next Page

While high levels of manganese may increase anemia by interfering with iron absorption, iron deficiency may increase an individual's susceptibility to manganese. Experimental studies suggest that populations at greatest risk of adverse effects due to manganese exposure are the very young and those with iron deficiency. Effects have been reported in the scientific literature at or below the U.S. OSHA Permissible Exposure Limit of 5 mg/m ^{3} as a ceiling value.

Although permanently disabled unless treated; chronic manganese poisoning is not a fatal disease. Disorders are reversible if recognized early and overexposure is eliminated. Not classifiable as a human or animal carcinogen, teratogen or mutagen.

CARCINOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.
MUTAGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.
TERATOGENIC EFFECTS: NONE by ACGIH, EPA, IARC, NTP, OSHA.

Section IV. First Aid Measures

EYE CONTACT	May cause eye irritation due to mechanical action. Flush with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Obtain medical attention if irritation persists.
MINOR SKIN CONTACT	May cause skin irritation. Wash contaminated skin with soap and water. Cover irritated skin with an emollient. If irritation persists, obtain medical attention. Wash contaminated clothing before reusing.
EXTENSIVE SKIN CONTACT	No additional information.
MINOR INHALATION	Allow to rest in a well ventilated area. Seek medical attention, if not feeling well.
SEVERE INHALATION	Over-exposure by inhalation may cause respiratory irritation. Rescuers should put on appropriate protective gear. Remove from area of exposure. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Keep warm. Get immediate medical attention.
SLIGHT INGESTION	If conscious, have person drink several glasses of water or milk and induce vomiting. Never give anything by mouth to an unconscious person. Lower the head so that the vomit will not reenter the mouth and throat. Obtain medical attention.
EXTENSIVE INGESTION	No additional information.

Section V. Fire and Explosion Data

THE PRODUCT IS	Non-flammable.
AUTO-IGNITION TEMPERATURE	Not applicable.
FLASH POINT	Not applicable.
FLAMMABILITY LIMITS	Not applicable.
PRODUCTS OF COMBUSTION	Not applicable.
FIRE HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	Not applicable.
EXPLOSION HAZARD IN THE PRESENCE OF VARIOUS SUBSTANCES	This substance is non-explosive.
FIRE FIGHTING MEDIA AND INSTRUCTIONS	Non-flammable.
SPECIAL REMARKS ON FIRE HAZARDS	No additional remark.

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Section X. Stability and Reactivity Data

STABILITY	The product is stable.
INSTABILITY TEMPERATURE	Not available.
CONDITIONS OF INSTABILITY	No additional remark.
INCOMPATABILITY WITH VARIOUS SUBSTANCES	Highly reactive with oxidizing agents.
CORROSIVITY	No specific information is available in our data base regarding the corrosivity of this product in presence of various materials. Slightly corrosive to copper, iron, and steel.
SPECIAL REMARKS ON REACTIVITY	Avoid strong oxidizing agents
SPECIAL REMARKS ON CORROSIVITY	Contact your sales representative or metallurgical specialist to ensure compatibility with system equipment.

Section XI. Toxicological Information

SIGNIFICANT ROUTES OF EXPOSURE	Ingestion.
TOXICITY TO ANIMALS	Acute oral toxicity (LD50): 2330 mg/kg [Mouse].
SPECIAL REMARKS ON TOXICITY TO ANIMALS	Low toxicity for humans or animals under normal conditions of use. May be harmful to livestock and wildlife if ingested. Clean up all spilled material, especially where bulk fertilizer loading of equipment occurs to prevent animal exposure. Aquatic/Marine Toxicity: Avoid spills or release to watercourses. Will disperse with current. Release to watercourses may cause effects down stream from the point of release. U.S. D.O.T.: This material NOT listed as a Marine pollutant.
OTHER EFFECTS ON HUMANS	No additional information is available in our database regarding other toxic effects of this material.
SPECIAL REMARKS ON CHRONIC EFFECTS ON HUMANS	No additional remark.
SPECIAL REMARKS ON OTHER EFFECTS ON HUMANS	No additional remark.

Section XII. Ecological Information

ECOTOXICITY	No additional information.
BOD and COD	Not available.
PRODUCTS OF DEGRADATION	Some metallic oxides. Sulfur oxides (SO2, SO3 ...).
TOXICITY OF THE PRODUCTS OF DEGRADATION	The products of degradation are as toxic as the original product.
SPECIAL REMARKS ON THE PRODUCTS OF DEGRADATION	Oxides of sulfur and manganese

Continued on Next Page

-TOMES Plus®, Vol 43, Jan 2000, Micromedex Inc.

OTHER SPECIAL CONSIDERATIONS	No additional remark.
FOR FURTHER SAFETY, HEALTH, OR ENVIRONMENTAL INFORMATION ON THIS PRODUCT, CONTACT	**AGRIUM** **Environment, Health and Safety Department** **Telephone (780) 998-6134 or Fax (780) 998-6143**

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